234

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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BELL SOUND
MODELS 2195, MG

BELL SOUND
MODELS 2195, MG

TRADE NAME	Bell Sound Models 2195, 2195MG
MANUFACTURER	Bell Sound Systems, Inc., 555 Marion Rd., Columbus, Ohio
TYPE SET	AC Operated 3 Channel 10 watt Audio Amplifier With 3 Speed Manual Record Player
TUBES (7 or 8)	Types (2) 6SJ7 Mic Pre-Amp., 6SL7GT Phono Pre-Amp., 6SL7GT Phase Inverter, (2) 6V6GT Audio Output, 5Y3GT Rectifier (Model 2195MG uses additional 6SC7 Phono Pre-Amp.)
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .78 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

BELL SOUND
MODEL 2195

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		BELL SOUND PART No.	STANDARD REPLACEMENT		
V1	Micro Pre. Amp.	6SJ7	6SJ7	8N	
V2	Micro Pre. Amp.	6SJ7	6SJ7	8N	
V3	Phono Pre. Amp.	6SL7GT	6SL7GT	8BD	
V4	AF Amplifier-Phase Inverter	6SL7GT	6SL7GT	8BD	
V5	Audio Output	6V6GT	6V6GT	7S	
V6	Audio Output	6V6GT	6V6GT	7S	
V7	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

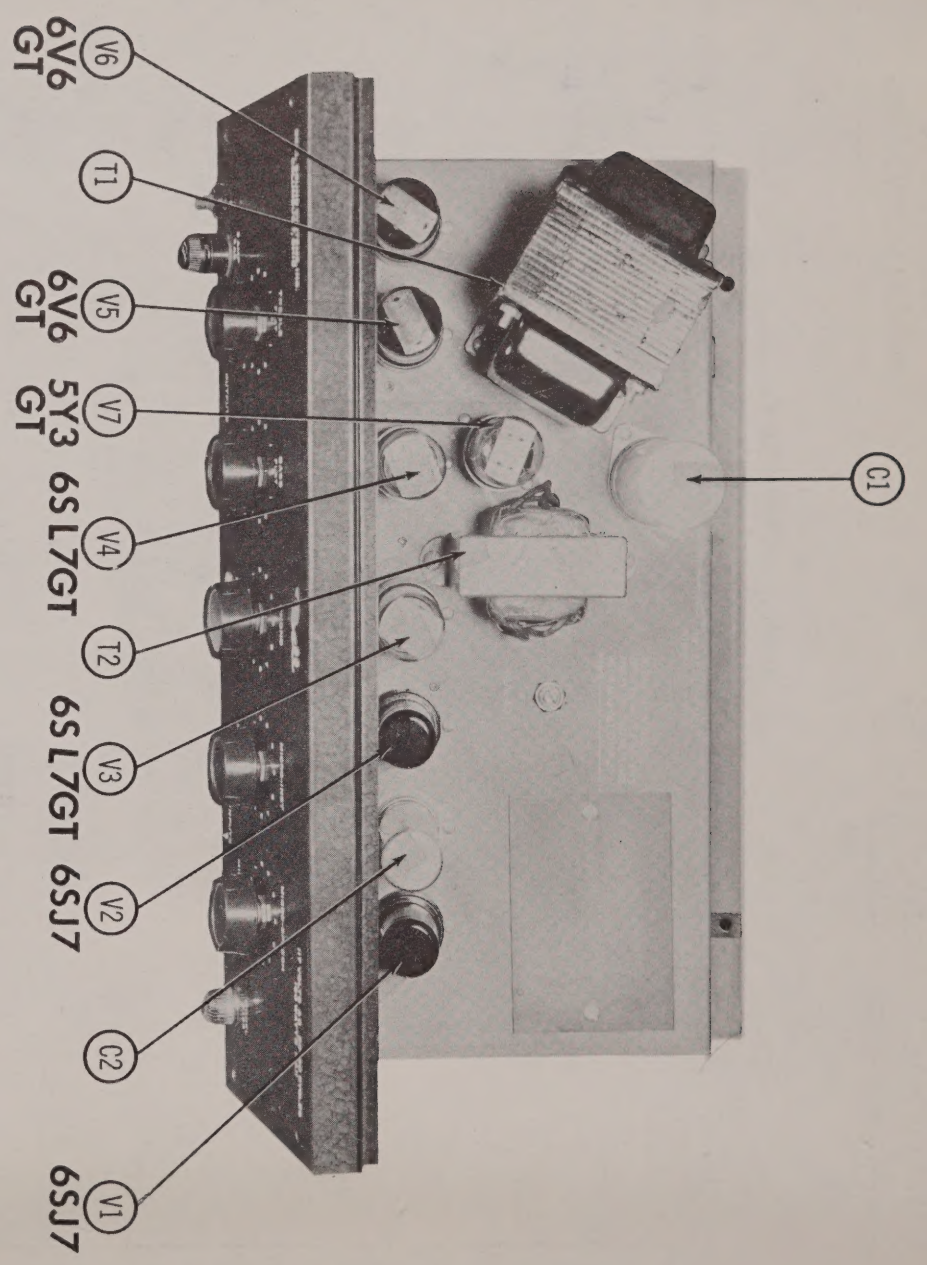
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Bell Sound PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲40	450		AFH3-134		C108		FP369.1	TVL-3758	
B	■40	450								
C	▲40	25								
C2A	■20	450		AFH2-51		B040		FP234	TVL-2755	
B	▲20	450								Note 1
C3	150	15						TC495	TVA-1311	
C4	150	15		PRS150/150		BRH5015		DC-511	5HK-S1	
C5	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C6	10000			BPD-01	DD-103	TM5S1	811-01	PT615	6TM-S5	
C7	.05	600		P688-05		PTE6S5		PT615	6TM-S5	
C8	.05	600		P688-05		PTE6S5		PT615	6TM-S5	
C9	.05	600		P688-05		PTE6S5		PT615	6TM-S5	
C10	.05	600		P688-05		PTE6S5		PT621	6TM-D1	
C11	.001	600		P688-001		PTE6D1		DC-511	5HK-S1	
C12	10000			BPD-01	DD-103	TM5S1	811-01	PT615	6TM-S5	
C13	.05	600		P688-05		PTE6S5		MCB235	MS-32	
C14	200	500		1479-0002		TR5T2		PT422	4TM-D2	
C15	.002	400		P488-002		PTE4D2		PT621	6TM-D1	Note 2
C16	.001	600		P688-001		PTE6D1		PT611	6TM-S1	
C17	.01	600		P688-01		PTE6S1		DC-511	5HK-S1	
C18	10000			BPD-01	DD-103	TM5S1	811-01	MCB237	MS-31	
C19	100	500		1479-0001		TR5T1		PT615	6TM-S5	
C20	.05	600		P688-05		PTE6S5		PT615	6TM-S5	
C21	.05	600		P688-05		PTE6S5		PT615	6TM-S5	
C22	.05	600		P688-05		PTE6S5				

Note 1. Not used in all Models.
Note 2. Some Models use a .002MFD @ 600V in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BELL SOUND PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	2 Meg	½	B20066P103	Q13-139	AG-66-S	B-76-S	U-55	Treble
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	2 Meg	½	B20066P102	Q13-139	AG-66-Z	B-76	U-55	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	1 Meg	½	B20066P118	Q13-137	AG-63-Z	B-70	U-53	Phono
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A
R4A	100KΩ	½	B20066P105	Q13-188	AG-51-Z	B-41	U-39	Micro-Inst
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R4A
R5A	1 Meg	½	B20066P118	Q13-137	AG-63-Z	B-70	U-53	Micro-Speech
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R5A
R6A	100Ω	2	B20066P115	W-100	A43-100	VK-121	R100L	Hum balance-wire wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R6A

CHASSIS—TOP VIEW



RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA BELL SOUND PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R7	1.2Meg	1/2		BTS-1.2Meg	
R8	1800Ω	1/2		BTS-1800	
R9	2.2Meg	1/2		BTS-2.2Meg	
R10	470KΩ	1/2		BTS-470K	
R11	1.2Meg	1/2		BTS-1.2Meg	
R12	1800Ω	1/2		BTS-1800	
R13	2.2Meg	1/2		BTS-2.2Meg	
R14	100KΩ	1/2		BTS-100K	
R15	270KΩ	1/2		BTS-270K	
R16	270KΩ	1/2		BTS-270K	
R17	270KΩ	1/2		BTA-270K	
R18	1500Ω	1/2		BTS-1500	Note 1
R19	100KΩ	1/2		BTS-100K	
R20	470KΩ	1/2		BTS-470K	
R21	1500Ω	1/2		BTS-1500	Note 1
R22	100KΩ	1/2		BTS-100K	
R23	240KΩ	1/2		BTS-240K	
R24	100KΩ	1/2		BTS-100K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA BELL SOUND PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R25	200KΩ	1/2		BTS-200K	
R26	20KΩ	1/2		BTS-20K	
R27	27KΩ	1/2		BTS-27K	
R28	270KΩ	1/2		BTS-270K	
R29	6800Ω	1/2		BTS-6800	
R30	470KΩ	1/2		BTS-470K	
R31	1.2Meg	1/2		BTS-1.2Meg	
R32	3300Ω	1/2		BTS-3300	
R33	130KΩ	1/2		BTS-130K	
R34	130KΩ	1/2		BGS-130K	
R35	270KΩ	1/2		BTS-270K	
R36	250Ω	4		1 3/4A-250	
R37	270KΩ	1/2		BTS-270K	
R38	100KΩ	1/2		BTS-100K	
R39	47KΩ	1/2		BTS-47K	
R40	3300Ω	1/2		BTS-3300	
R41	2200Ω	1		BTA-2200	
R42	100KΩ	2		BTB-100K	

Note: Some models may use a 1600Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA Bell Sound PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @.78A	684VCT .094ADC	5VAC @2A	6.3VAC @2.5A	B-20243	PC-8409① ②	P-3152① ②	R-11A ① ②	P9310 ① ②	TS-24R04U ① ②

① Drill new mounting holes.
② Tape center tap on 6.3V windings.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Bell Sound PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T2	6.3KΩ CT	16Ω tap @ 8Ω, 4Ω	B-20229		A-3016	S-29X①			① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Bell Sound PART No. FUSE	Bell Sound PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	3A 250V			312003 (3AG-3A)	342001	AGC3	HKP

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA Bell Sound PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M2		CAC-D-J *400-CAC-D-J	Q & Q-33			96	0-1 or S-1 & 0-3 or S-3	* Complete arm and cartridge assembly

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

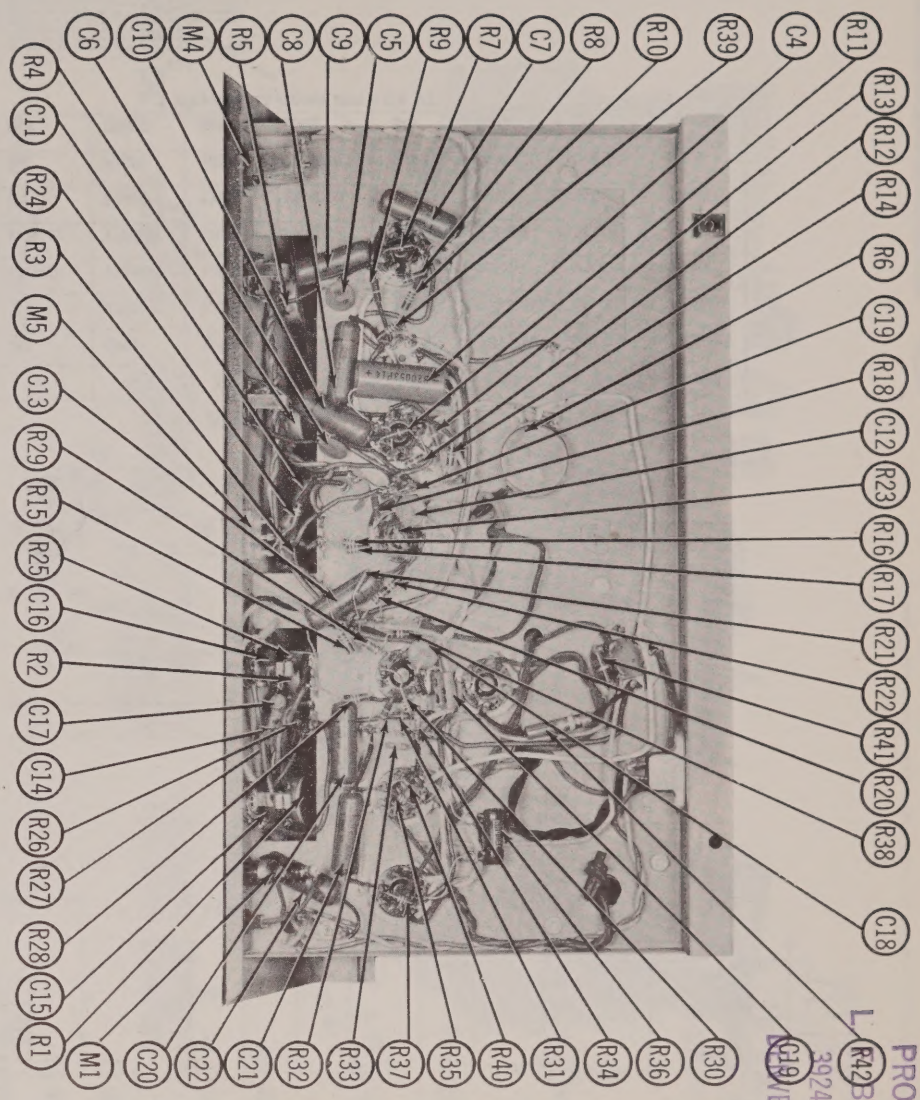
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA Bell Sound PART No.	WALCO PART No.	JENSEN PART No.	REMARKS
M3		W-2A or W-2S & W-2MGA or W-2MGS	A-80 or A-81 & A-80LP or A-81LP	

MISCELLANEOUS

ITEM No.	PART NAME	Bell Sound PART No.	NOTES
M4	Dial Light		#47 Bayonet
M5	Switch		Noise filter SPST Slide

CHASSIS—BOTTOM VIEW



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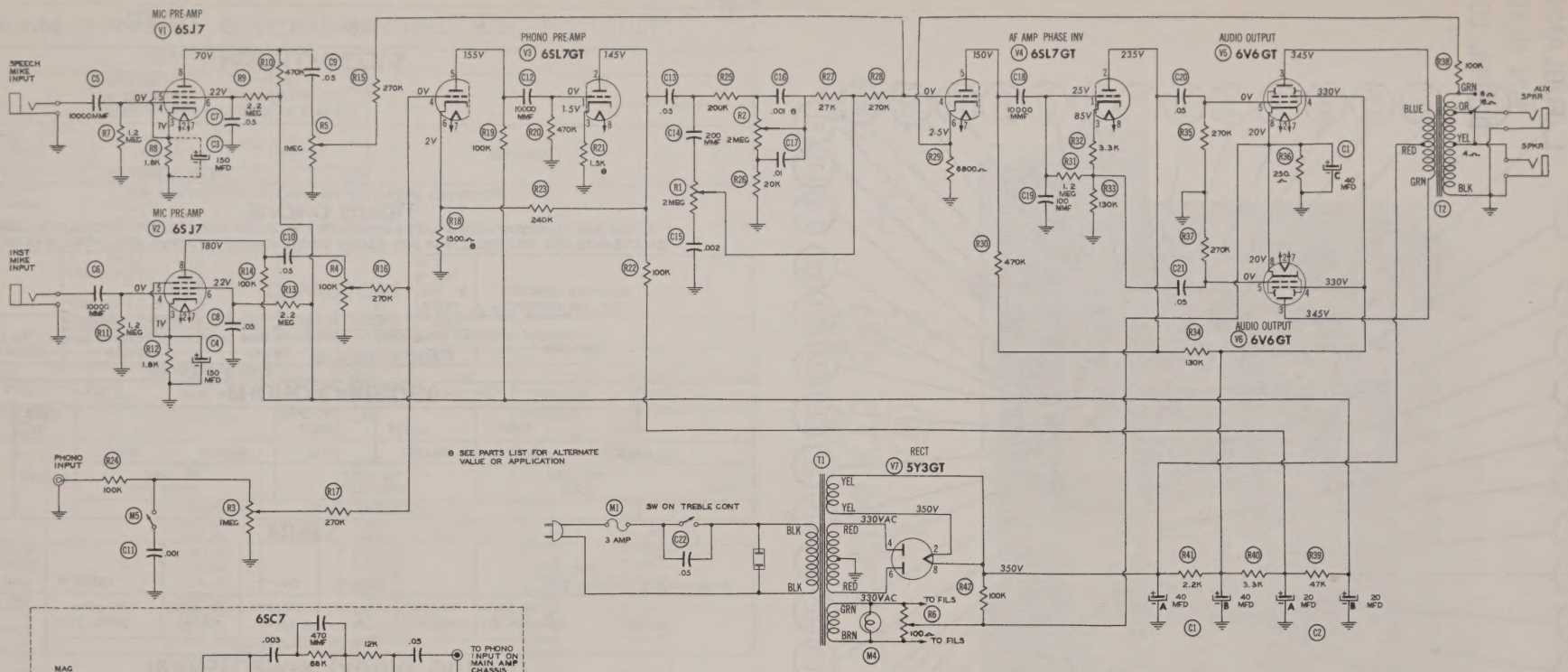

θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SJ7	0Ω	270Ω	1.8KΩ	1.2Meg	1.8KΩ	†2.2Meg	270Ω	†520KΩ
V 2	6SJ7	0Ω	270Ω	1.8KΩ	1.2Meg	1.8KΩ	†2.2Meg	270Ω	†150KΩ
V 3	6SL7	470KΩ	†100KΩ	1.5KΩ	130KΩ	†150KΩ	1.5KΩ	270Ω	270Ω
V 4	6SL7	1.3Meg	†130KΩ	130KΩ	180KΩ	†470KΩ	6.8KΩ	270Ω	270Ω
V 5	6V6GT	0Ω	270Ω	†210Ω	†2.2KΩ	270KΩ	INF	270Ω	250Ω
V 6	6V6GT	0Ω	270Ω	†210Ω	†2.2KΩ	270KΩ	INF	270Ω	250Ω
V 7	5Y3GT	INF	100KΩ	INF	120Ω	INF	110Ω	INF	100KΩ

† MEASURED FROM PIN 8 OF V7.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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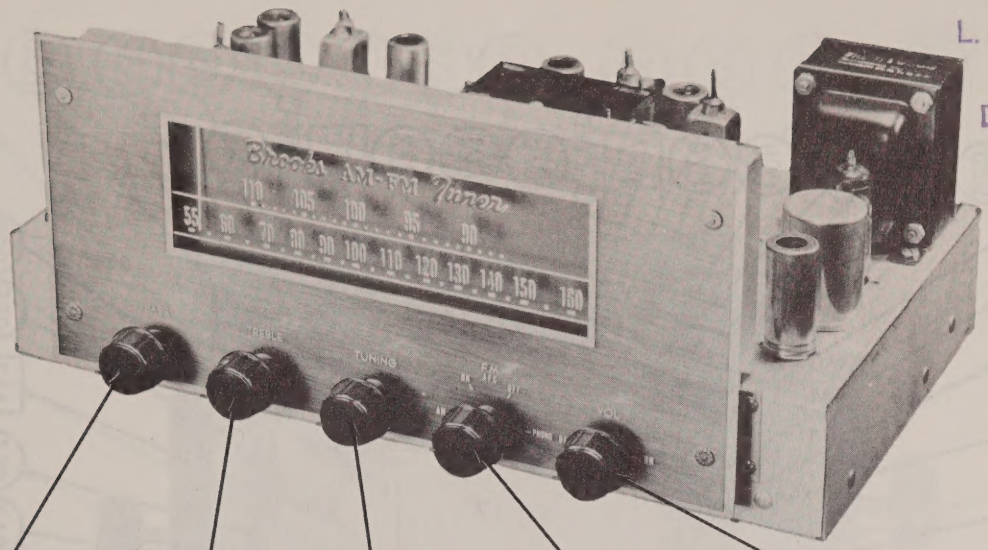
3924 MEADE ST.
DENVER, COLORADO

BROOKS
MODEL ST-15A



BASS CONTROL

TREBLE CONTROL

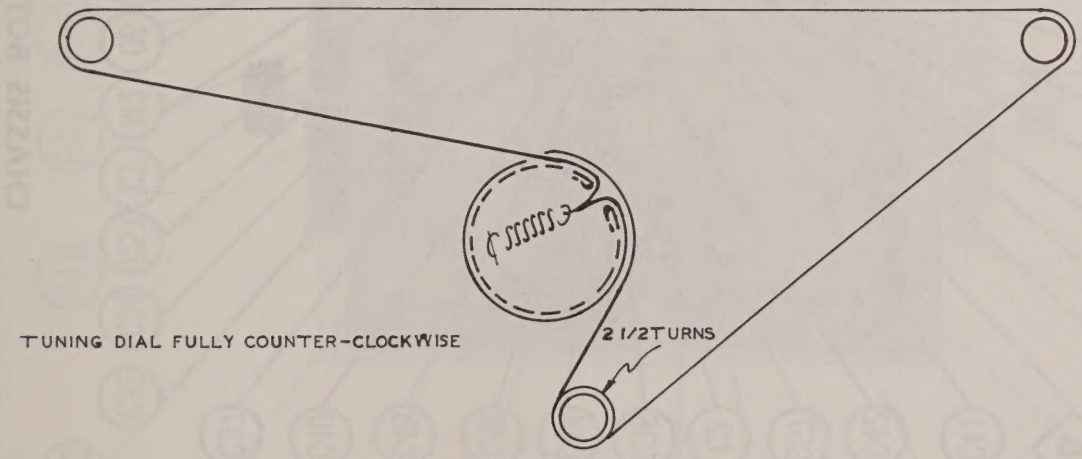
TUNING CONTROL

FUNCTION SELECTOR SWITCH

VOLUME CONTROL ON-OFF SWITCH

BROOKS
MODEL ST-15A

TRADE NAME	Brooks Model ST-15A	
MANUFACTURER	Brooks Laboratories, Inc., 751 Main St., Waltham, Mass.	
TYPE SET	AC Operated AM-FM Superheterodyne Tuner For Custom Installations	
TUBES	Fifteen	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING .61 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	535 - 1600KC	FREQ. MOD. 87-110MC



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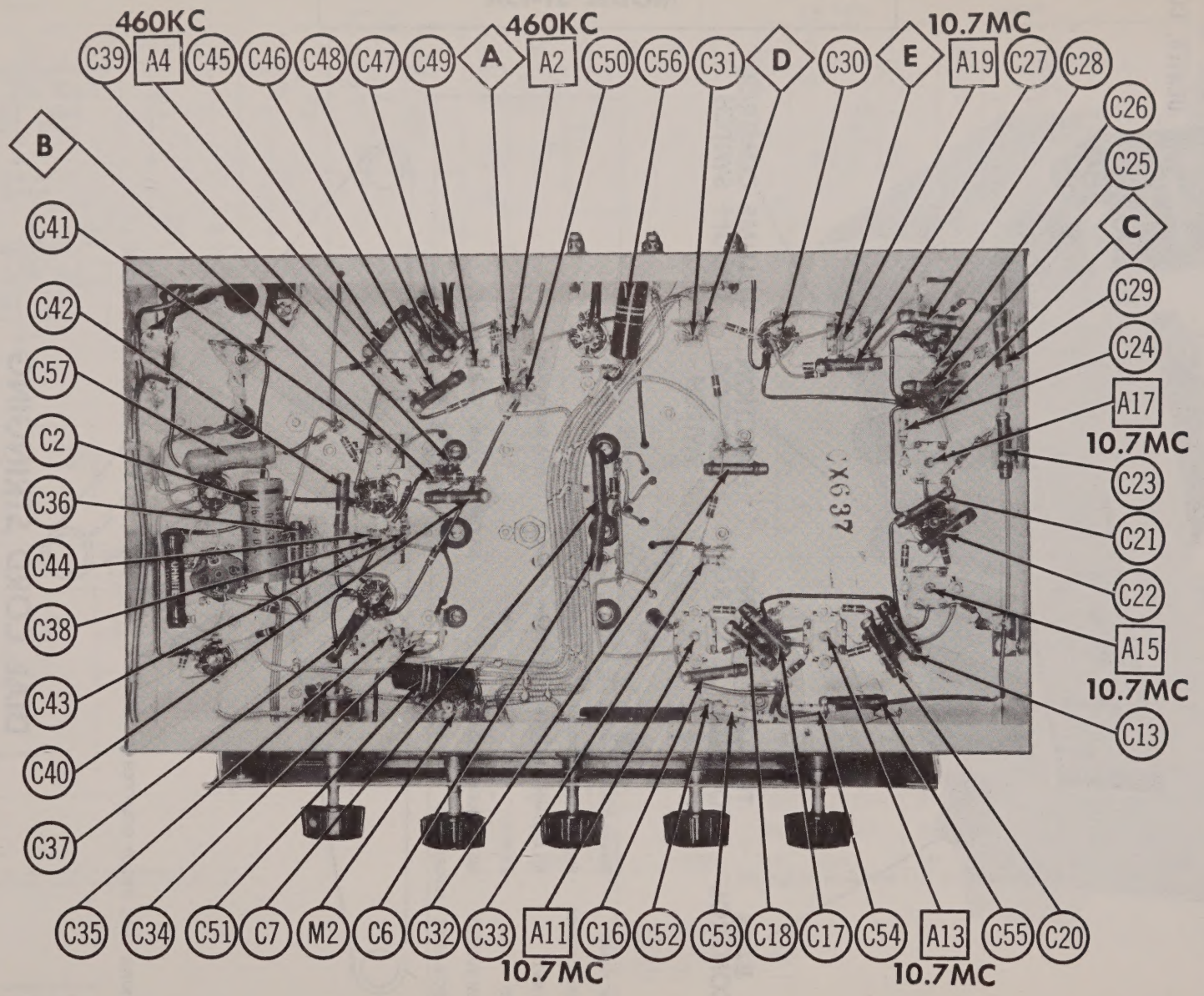
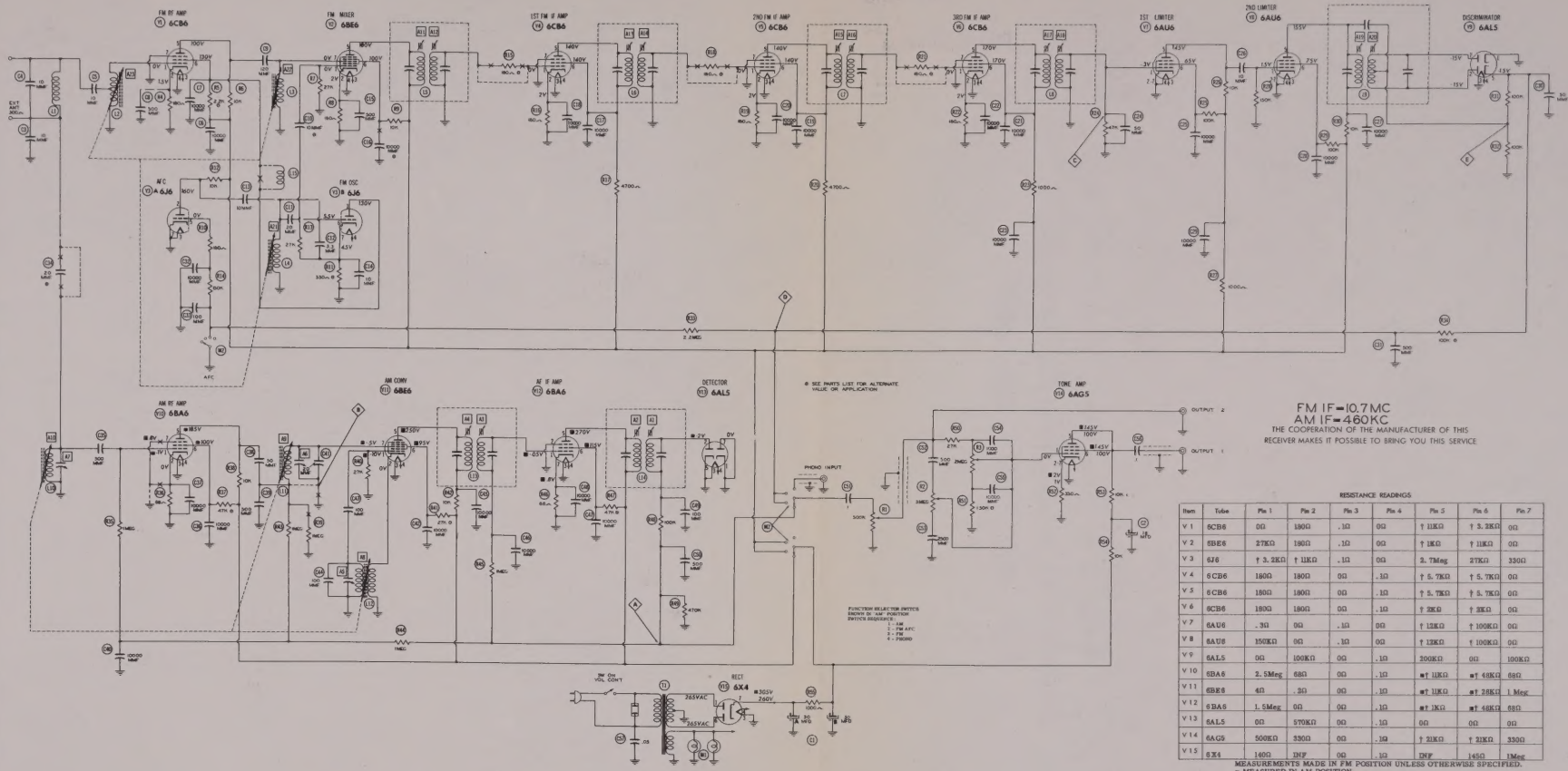


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION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FM MIXER V2 6BE6
1ST FM IF AMP V4 6CB6
2ND FM IF AMP V5 6CB6
3RD FM IF AMP V6 6CB6
1ST LIMITER V7 6AU6
2ND LIMITER V8 6AU6
DISCRIMINATOR V9 6AL5
AFC V10 A 6J6
FM OSC V3 B 6J6
AM RF AMP V10 6BA6
AM CONV V11 6BE6
AF IF AMP V12 6BA6
DETECTOR V13 6AL5
TONE AMP V14 6AG5
RECT V15 6X4
PHONO INPUT
OUTPUT 2
OUTPUT 1
3W CKT VOL CONT
FUNCTION SELECTOR SWITCH SHOWN IN "AM" POSITION
SWITCH SEQUENCE:
1 - AM
2 - AM AFC
3 - FM
4 - PHONO
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

FM IF=10.7MC
AM IF=460KC
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6CB6	0Ω	180Ω	.1Ω	0Ω	† 11KΩ	† 3. 2KΩ	0Ω
V 2	6BE6	27KΩ	180Ω	.1Ω	0Ω	† 1KΩ	† 11KΩ	0Ω
V 3	6J6	† 3. 2KΩ	† 11KΩ	.1Ω	0Ω	2. 7Meg	27KΩ	330Ω
V 4	6CB6	180Ω	180Ω	0Ω	.1Ω	† 5. 7KΩ	† 5. 7KΩ	0Ω
V 5	6CB6	180Ω	180Ω	0Ω	.1Ω	† 5. 7KΩ	† 5. 7KΩ	0Ω
V 6	6CB6	180Ω	180Ω	0Ω	.1Ω	† 2KΩ	† 2KΩ	0Ω
V 7	6AU6	. 3Ω	0Ω	.1Ω	0Ω	† 12KΩ	† 100KΩ	0Ω
V 8	6AU6	150KΩ	0Ω	.1Ω	0Ω	† 12KΩ	† 100KΩ	0Ω
V 9	6AL5	0Ω	100KΩ	0Ω	.1Ω	200KΩ	0Ω	100KΩ
V 10	6BA6	2. 5Meg	68Ω	0Ω	.1Ω	■† 11KΩ	■† 48KΩ	68Ω
V 11	6BE6	4Ω	. 2Ω	0Ω	.1Ω	■† 11KΩ	■† 28KΩ	1 Meg
V 12	6BA6	1. 5Meg	0Ω	0Ω	.1Ω	■† 1KΩ	■† 48KΩ	68Ω
V 13	6AL5	0Ω	570KΩ	0Ω	.1Ω	0Ω	0Ω	0Ω
V 14	6AG5	500KΩ	330Ω	0Ω	.1Ω	† 2KΩ	† 2KΩ	330Ω
V 15	6X4	140Ω	INF	0Ω	.1Ω	INF	145Ω	1Meg

MEASUREMENTS MADE IN FM POSITION UNLESS OTHERWISE SPECIFIED.
■ MEASURED IN AM POSITION.
† MEASURED FROM PIN 7 OF V15.

1. DC voltage measurements taken with vacuum tube voltmeter.
AC voltages measured at 1000 ohms per volt.
2. Measurements are shown as bottom readings.
3. Measurements were made with no signal and maximum sensitivity.
4. Line voltage maintained at 117 volts for voltage readings.
5. Readings between an unwanted station and no station position a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Allow a 15 minute warm-up period for receiver and test equipment.

AM ALIGNMENT

A 20,000Ω / volt voltmeter should be used as the output meter.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to point Ⓓ. Low side to chassis.	460KC (400∿Mod)	AM	Tuning gang fully open	Connect negative lead thru 47KΩ to point Ⓐ. Positive lead to chassis.	A1, A2, A3, A4	Adjust for maximum deflection. Attenuate signal generator to maintain 2 to 3 volts at output meter.
2.	"	High side to antenna terminal #2. Low side to chassis.	1600KC	"	1600KC	"	A5, A6, A7	Adjust for maximum deflection.
3.	Use set antenna	Not used	Not used	"	Tune in station at or near 850KC	"	A8	Set dial pointer to frequency of station being received. If necessary adjust A8 for maximum deflection.
4.	"	"	"	"	"	"	A9, A10	Adjust for maximum deflection.
5.	"	"	"	"	Tune in station near 1600KC	"		Retouch A6 and A7 for maximum deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓒ. Common to chassis.	A18,A17, A16,A15, A14,A13, A12, A11	Adjust in order given for maximum deflection.
7.	"	"	"	"	"	DC probe thru 1Meg to point Ⓔ. Common to chassis.	A19	Adjust for maximum deflection.
8.	"	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A20	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. amp. thru 10KΩ to point Ⓒ. Low side to chassis.	A18, A17 A16, A15 A14, A13, A12, A11	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
7.	"	"	"	"	"	Vert. amp. thru 10KΩ to point Ⓔ. Low side to chassis.	A19	"
8.	"	"	"	"	"	Vert. amp. thru 10KΩ to point Ⓓ.	A20	Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A18 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	270Ω Carbon Resistor	High side thru 270Ω to antenna terminal #1. Low side to antenna terminal #2.	98MC (Unmod.)	FM	98MC	DC probe to point Ⓒ. Common to chassis.	A21,A22 A23	Adjust in order given for maximum deflection.

FM RF ALIGNMENT USING FM STATION AS SIGNAL SOURCE

Tune in an FM station of known frequency near the center of the band. Adjust A21 until dial pointer indicates same frequency as station being received. Adjust A22 and A23 for maximum volume.

FIG. 1

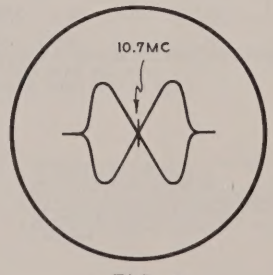


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: BROOKS PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	FM RF Amplifier	6CB6	6CB6	7CM	
V2	FM Mixer	6BE6	6BE6	7CH	
V3	FM Osc.-AFC	6J6	6J6	7BF	
V4	1st. FM IF Amp.	6CB6	6CB6	7CM	
V5	2nd. FM IF Amp.	6CB6	6CB6	7CM	
V6	3rd. FM IF Amp.	6CB6	6CB6	7CM	
V7	1st. Limiter	6AU6	6AU6	7BK	
V8	2nd. Limiter	6AU6	6AU6	7BK	
V9	Discriminator	6AL5	6AL5	6BT	
V10	AM RF Amplifier	6BA6	6BA6	7BK	
V11	AM Converter	6BE6	6BE6	7CH	
V12	AF IF Amplifier	6BA6	6BA6	7BK	
V13	Detector	6AL5	6AL5	6BT	
V14	Tone Amplifier	6AG5	6AG5	7BD	
V15	Rectifier	6X4	6X4	5BS	

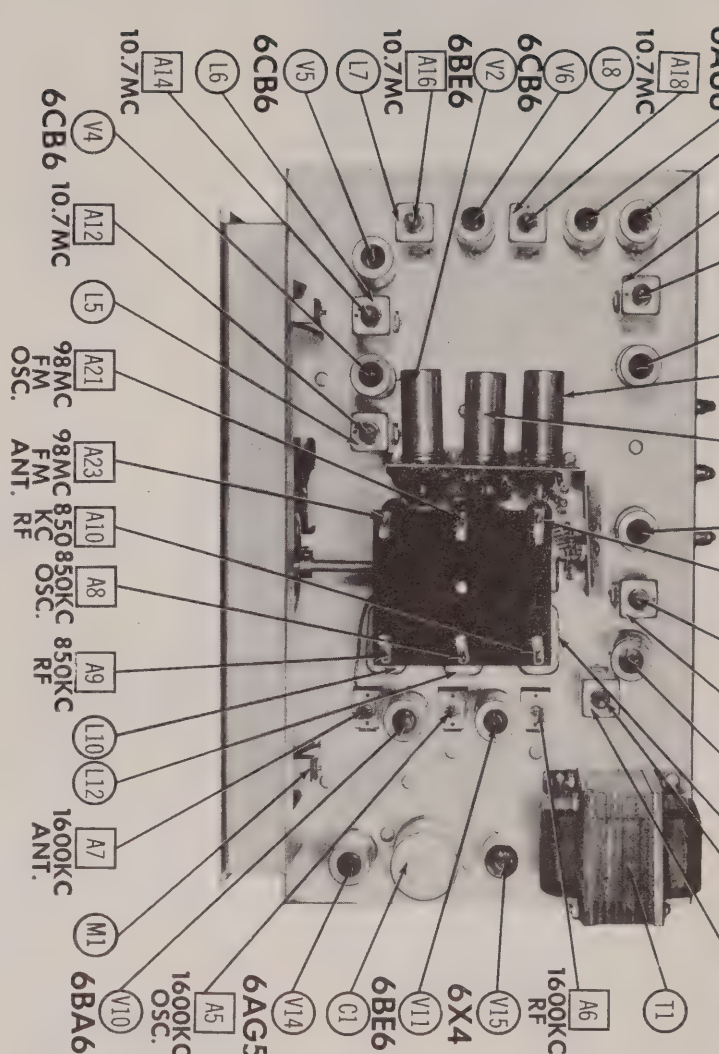
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: BROOKS PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲30	350		AFH2-54		B043		FP237	TVL-2759	
B	▲30	300								
C2	16	250		PRS250/16		BR1625		TC54	TVA-1507	
C3	10			SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	
C4	10			SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	
C5	10			SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	
C6	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C7	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C8	500			SI500	D6-501	TP47	GP2K-501	UC- 535	5GA-T5	
C9	120				TCN-120	TN24				
C10	10			SI10N750	TCN-10	TN01	N750K-100	NT-541	5TCU-Q1	Note 1
C11	20			SI20N750	TCN-20	TN05			5TCU-Q2	
C12	3.3			SI3.3NP0	TCZ-3.3	TZ06	NP0K-3R3	ZT-5533	5TCCB-V33	
C13	10			SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	
C14	10			SI10N750	TCN-10	TN01	N750K-100	NT-541	5TCU-Q1	
C15	500			SI500	D6-501	TP47	GP2K-501	UC-535	5GA-T5	
C16	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	Note 2
C17	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C18	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C19	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C20	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C21	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C22	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C23	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C24	50			SI50	D6-500	TP30	GP1K-500	UC-545	5GA-Q5	
C25	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C26	10			SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	
C27	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C28	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C29	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HI-S1	
C30	50			SI50	D6-500	TP30	GP1K-500	UC-545	5GA-Q5	
C31	500			SI500	D6-501	TP47	GP2K-501	UC-535	5GA-T5	
C32	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C33	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C34	20			SI20N750	TCN-20	TN05			5TCU-Q2	Note 2
C35	500			SI500	D6-501	TP47	GP2K-501	UC-535	5GA-T5	
C36	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C37	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C38	50			SI50	D6-500	TP30	GP1K-500	UC-545	5GA-Q5	
C39	500			SI500	D6-501	TP47	GP2K-501	UC-535	5GA-T5	
C40	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C41	20			SI20N750	TCN-20	TN05			5TCU-Q2	
C42	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C43	100			SI100N750	TCN-100	TN22	N750L-101	NT-531	5TCU-T1	
C44	100			SI100N750	TCN-100	TN22	N750L-101	NT-531	5TCU-T1	

(CONT'D ON NEXT PAGE)

CHASSIS—TOP VIEW



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PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	BROOKS PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C45	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C46	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C47	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C48	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C49	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C50	500			SI500	D6-501	TP47	GP2K-501	UC-535	5GA-T5	
C51	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C52	500			SI500	D6-501	TP47	GP2K-501	UC-535	5GA-T5	
C53	2500			SI2500	D6-252	TP58	GP2-333-252	UC-5225	5HK-D25	
C54	1000			SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C55	10000			SI10000	D6-103	TP67	GP2-333-103	DC-511	5HK-S1	
C56	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C57	.05	400		P488-05		CUB4S5		PT415	4TM-S5	

Note 1. Some Models use 6MMF in this application.
Note 2. Not used in all Models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	BROOKS PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	34-011-560	Q13-133	AG-60-Z	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	3 Meg	½	BA011-030	Q13-140	AG-67-Z	B-85	U-57	Treble
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	2 Meg	½	BA011-029	Q13-139	AG-66-Z	B-76	U-55	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	BROOKS PART No.	IRC PART No.	NOTES
R4	180Ω	½		BTS-180	
R5	2200Ω	½		BTS-2200	Note 1
R6	10KΩ	½		BTS-10K	
R7	27KΩ	½		BTS-27K	
R8	180Ω	½		BTS-180	
R9	10KΩ	½		BTS-10K	
R10	180Ω	½		BTS-180	
R11	330Ω	½		BTS-330	Note 2
R12	10KΩ	½		BTS-10K	
R13	27KΩ	½		BTS-27K	
R14	150KΩ	½		BTS-150K	
R15	180Ω	½		BTS-180	Note 3
R16	180Ω	½		BTS-180	
R17	4700Ω	½		BTS-4700	
R18	180Ω	½		BTS-180	Note 3
R19	180Ω	½		BTS-180	
R20	4700Ω	½		BTS-4700	
R21	180Ω	½		BTS-180	Note 3
R22	180Ω	½		BTS-180	
R23	1000Ω	½		BTS-1000	
R24	47KΩ	½		BTS-47K	
R25	100KΩ	½		BTS-100K	
R26	10KΩ	½		BTS-10K	
R27	1000Ω	½		BTS-1000	
R28	150KΩ	½		BTS-150K	
R29	100KΩ	½		BTS-100K	

ITEM No.	RATING OHMS	RATING WATT	BROOKS PART No.	IRC PART No.	NOTES
R30	10KΩ	½		BTS-10K	
R31	100KΩ	½		BTS-100K	
R32	100KΩ	½		BTS-100K	
R33	2. 2Meg	½		BTS-2. 2Meg	
R34	100KΩ	½		BTS-100K	Note 7
R35	1Meg	½		BTS-1Meg	
R36	68Ω	½		BTS-68	
R37	47KΩ	½		BTS-47K	Note 4
R38	10KΩ	½		BTS-10K	
R39	1Meg	½		BTS-1Meg	
R40	27KΩ	½		BTS-27K	
R41	27KΩ	½		BTS-27K	Note 5
R42	10KΩ	½		BTS-10K	
R43	1 Meg	½		BTS-1Meg	
R44	1 Meg	½		BTS-1Meg	
R45	1 Meg	½		BTS-1Meg	
R46	68Ω	½		BTS-68	
R47	47KΩ	½		BTS-47K	Note 4
R48	100KΩ	½		BTS-100K	
R49	470KΩ	½		BTS-470K	
R50	27KΩ	½		BTS-27K	
R51	150KΩ	½		BTS-150K	Note 6
R52	330Ω	½		BTS-330	
R53	10KΩ	½		BTS-10K	
R54	10KΩ	½		BTS-10K	
R55	1000Ω	10		1 3/4A-1000	

Note 1. Some models may use a 4700Ω resistor in this application.
Note 2. Some models may use a 180Ω resistor in this application.
Note 3. Not used in all models.
Note 4. Some models may use a 27KΩ resistor in this application.
Note 5. Some models may use a 10KΩ resistor in this application.
Note 6. Some models may use a 220KΩ resistor in this application.
Note 7. Some models may use a 150KΩ resistor in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	BROOKS PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC ② .61A	510VCT .074A	6.3VAC ② 5.4A		19853	PC-8420①	P-3148①	R-10A ①②	P9214	T-26R31U

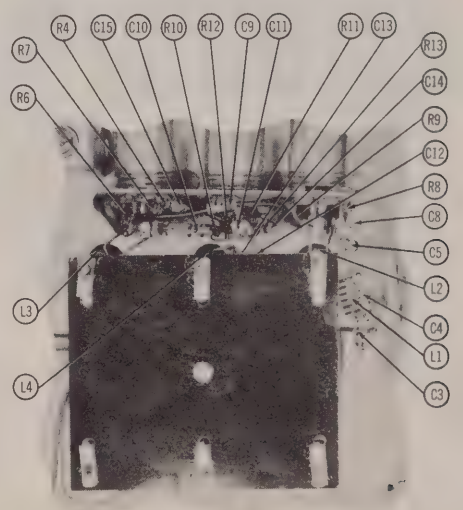
① Drill new mounting holes.
② Tape 5V winding.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	BROOKS PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Coil	0Ω						
L2	FM Ant. Coil	0Ω (tapped)						
L3	FM RF Coil	0Ω						
L4	FM Osc. Coil	0Ω						
L5	1st FM IF	.3Ω	.3Ω	16492-4	16-3487	FM-254	1463	
L6	2nd FM IF	.3Ω	.3Ω	16492-4	16-3487	FM-254	1463	
L7	3rd FM IF	.3Ω	.3Ω	16492-4	16-3487	FM-254	1463	
L8	4th FM IF	.3Ω	.3Ω	16492-4	16-3487	FM-254	1463	
L9	FM Discrim.	1.2Ω	1.4ΩCT	15808		FM-253	1464	
L10	AM Ant. Coil	9.5Ω						
L11	AM RF Coil	10Ω						
L12	AM Osc. Coil	.2Ω	4Ω					
L13	AM Input IF	24Ω	27Ω	16517-1	16-6758	BC-352	12-C1	
L14	AM Output IF	20Ω	25Ω	16517-2	16-6758	BC-353	12-C2	
L15	RF Choke							Not used in all models.

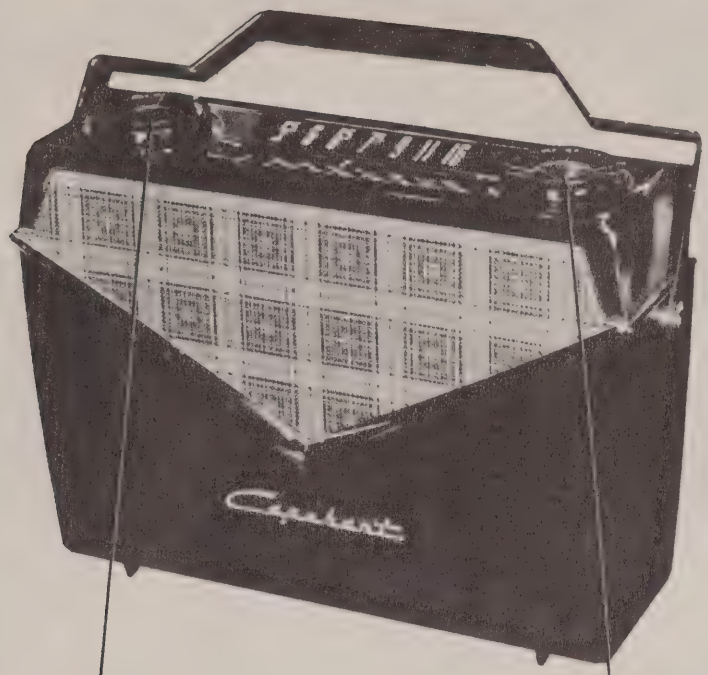
MISCELLANEOUS

ITEM No.	PART NAME	BROOKS PART No.	NOTES
M1	Dial Light		(2) #51 Bayonet
M2	Switch		AM-FM & AFC On/Off



RF-SUB-ASSEMBLY

CAPEHART
MODEL P-213 (Ch. CR-85)



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DENVER, COLORADO

CAPEHART
MODEL P-213 (Ch. CR-85)

TRADE NAME	Capehart Model P-213 (Ch. CR-85)
MANUFACTURER	Capehart-Farnsworth Corp., Fort Wayne, Indiana
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	105-125 Volts AC-DC (or) 3 Volts "A" Supply & 67½ Volts "B" Supply
RATING	.11 Amp. @ 117 Volts AC (or) 150MA @ 3 Volts DC & 7MA @ 67½ Volts DC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1U4 (V2). Low side to B-.	455KC (400~Mod)	Tuning gang fully closed	Across voice coil	A1, A2	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	"	"	"	A3, A4	"
3.	"	"	540KC	"	"	A5	"
4.	"	"	1620KC	Tuning gang fully open	"	A6	"
5.		Loop	1500KC	Tune to 1500KC signal	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

On revised Models, determined by the coding R-1 after the serial number on tube layout, the antenna trimmer (A7) has been deleted. The antenna may be tuned by breaking the wax seal on the rod antenna and sliding the rod back or forth. After tuning the antenna in this manner, reseal the rod.

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PARTS LIST AND DESCRIPTIONS

CAPEHART
MODEL P-213 (Ch. CR-85)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: CAPEHART PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CAPEHART PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	750381A-3	PRS106D50A		BBRT4415		3N529	TVA-3433	Orange
B	40	150				X25				Orange
C	250	10								Red
C2	20000		450469A-10		DD-203	K085			5HK-S2	
C3	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C4	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C5	47		2240-006	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C6	5000		450469A-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C7A	150					TP36	GP2K-151	UC-5315		
B	2000					K072	801-002	DC-522		
C	150		*453566A-1	*PA-136	*PC-165	TP36	GP2K-151	UC-5315	*103C6	
D	10000					K082	811-01	DC-511		
E	5000					K080	801-005	DC -525		
C8	100		650030A-14	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C9	5		650030A-22	SI5	D6-050	TP06	GP1K-050	NT-555	5GA-V5	
C10	1500		450469A-2	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C11	.047	600	2248-4730	689ZX-047		PJ6S47		PT6147	6TM-S47	
C12	1500		450469A-2	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	

* Items C7A, C7B, C7C, C7D, C7E, R6A, R6B, R6C and R6D are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CAPEHART PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	750276A-4	Q13-133	AG-60-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CAPEHART PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	100KΩ	½	3230-104	BTS-100K	
R3	3.3Meg	½	3230-335	BTS-3.3Meg	
R4	15KΩ	½	3230-153	BTS-15K	
R5	3.3Meg	½	3230-335	BTS-3.3Meg	
R6A	10Meg	½		BTS-10Meg	
B	4.7Meg	½		BTS-4.7Meg	
C	1Meg	½	* 453566A-1	BTS-1 Meg	
D	3.3Meg	½		BTS-3.3Meg	
R7	3.9Meg	½	3230-395	BTS-3.9Meg	
R8	27Ω	½	3229-270	BTS-27	

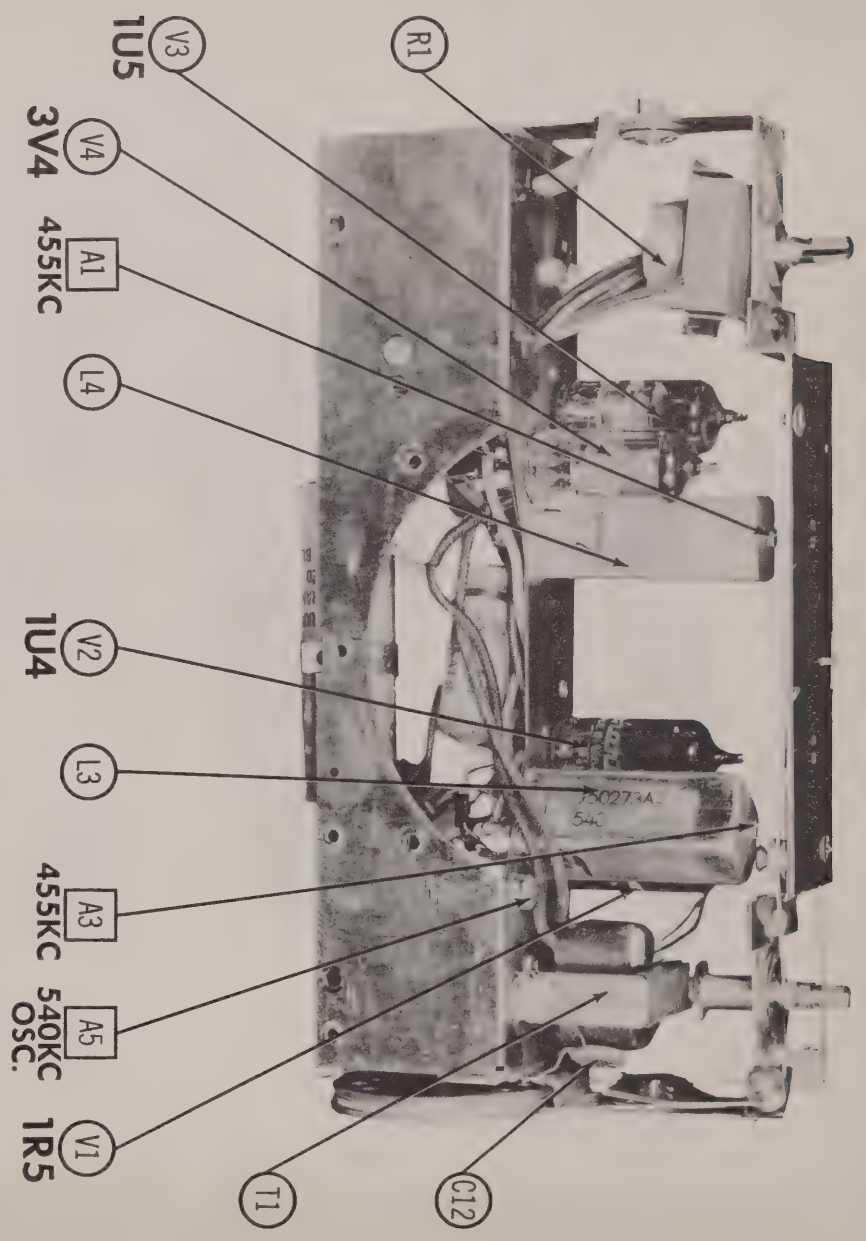
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CAPEHART PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R9	2200Ω	½	3229-222	BTS-2200	
R10	2200Ω	½	3229-222	BTS-2200	
R11	2700Ω	½	3229-272	BTS-2700	
R12	220KΩ	½	3230-224	BTS-220K	
R13	470Ω	½	3229-471	BTS-470	
R14	1000Ω	½	3229-102	BTS-1000	
R15	1400Ω	7	650101A-28	1 3/4-1450	
R16	150Ω	4	650101A-29	PW4-150	
R17	33Ω	1	650101A-19		

* Items R6A, R6B, R6C, R6D, C7A, C7B, C7C, C7D, C7E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: CAPEHART PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	9.7KΩ	3.4Ω	453489B-1	A-3329	A-2998	S-11X	Z1110	TS-24S49	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CAPEHART PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.4Ω	650701B-1	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CAPEHART PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	1.9Ω		453484B-1				
L2	Osc. Coil	1.6Ω	9.5Ω	453495A-1	14-1074		71-Osc.	
L3	Input IF	15Ω	15Ω	750273A-1	16-6758	BC-352	12-C1	
L4	Output IF	15Ω	15Ω	750273A-1	16-6758	BC-353	12-C2	

SELENIUM RECTIFIER

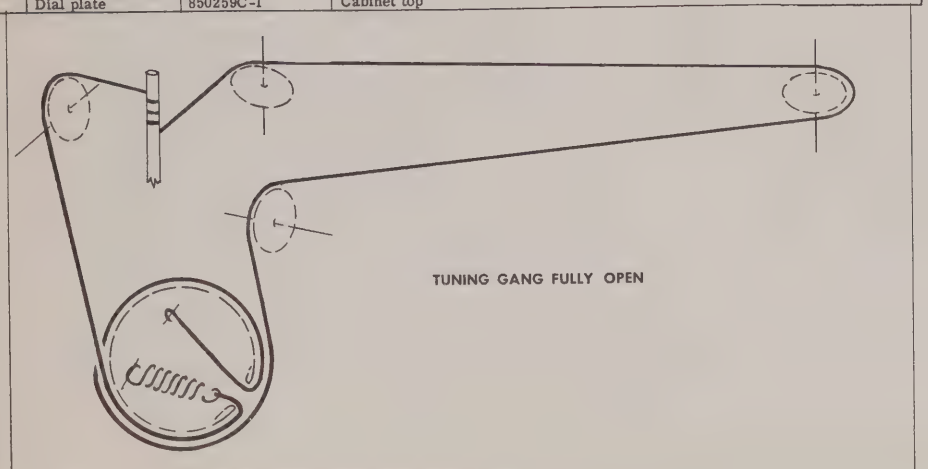
ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	CAPEHART PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.065A	6501500-5	5M4	1003A	6S75	75	

BATTERIES

ITEM No.	VOLTAGE	CAPEHART PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	$1\frac{1}{2}$ V "A"		964			2IR			2 Used in series
M3	$67\frac{1}{2}$ V "B"			477			P45		

MISCELLANEOUS

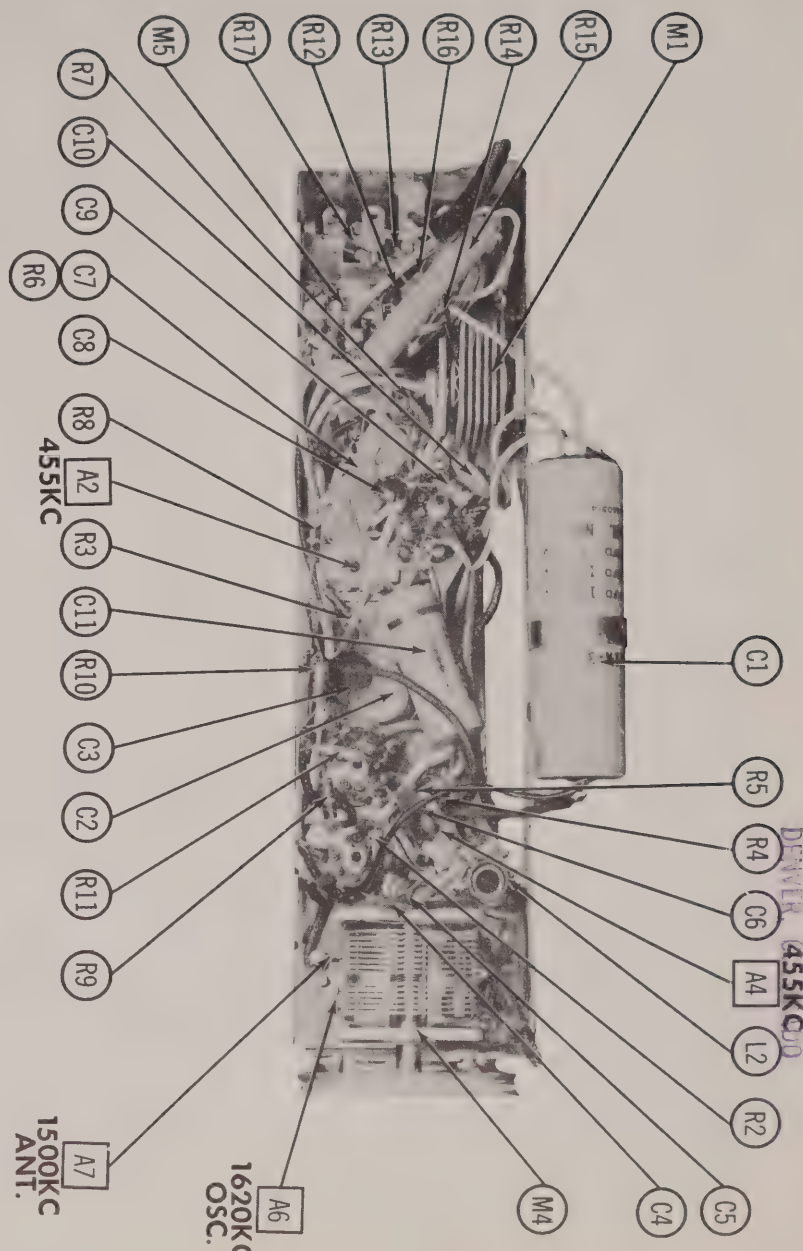
ITEM No.	PART NAME	CAPEHART PART No.	NOTES
M4	Tuning cap	650697A-1	2 section (18-190MMF, 14-115MMF)
M5	Switch	650698A[1]	Power changeover
	Cabinet	850261B-1	Turf green
	Cabinet	850261B-2	Ebony
	Cabinet	850261B-3	Grey blue
	Knob	650702A-1	(2)
	Dial plate	850259C-1	Cabinet top



DRIVE CORD STRINGING

SET 234 FOLDER 3

CHASSIS—BOTTOM VIEW



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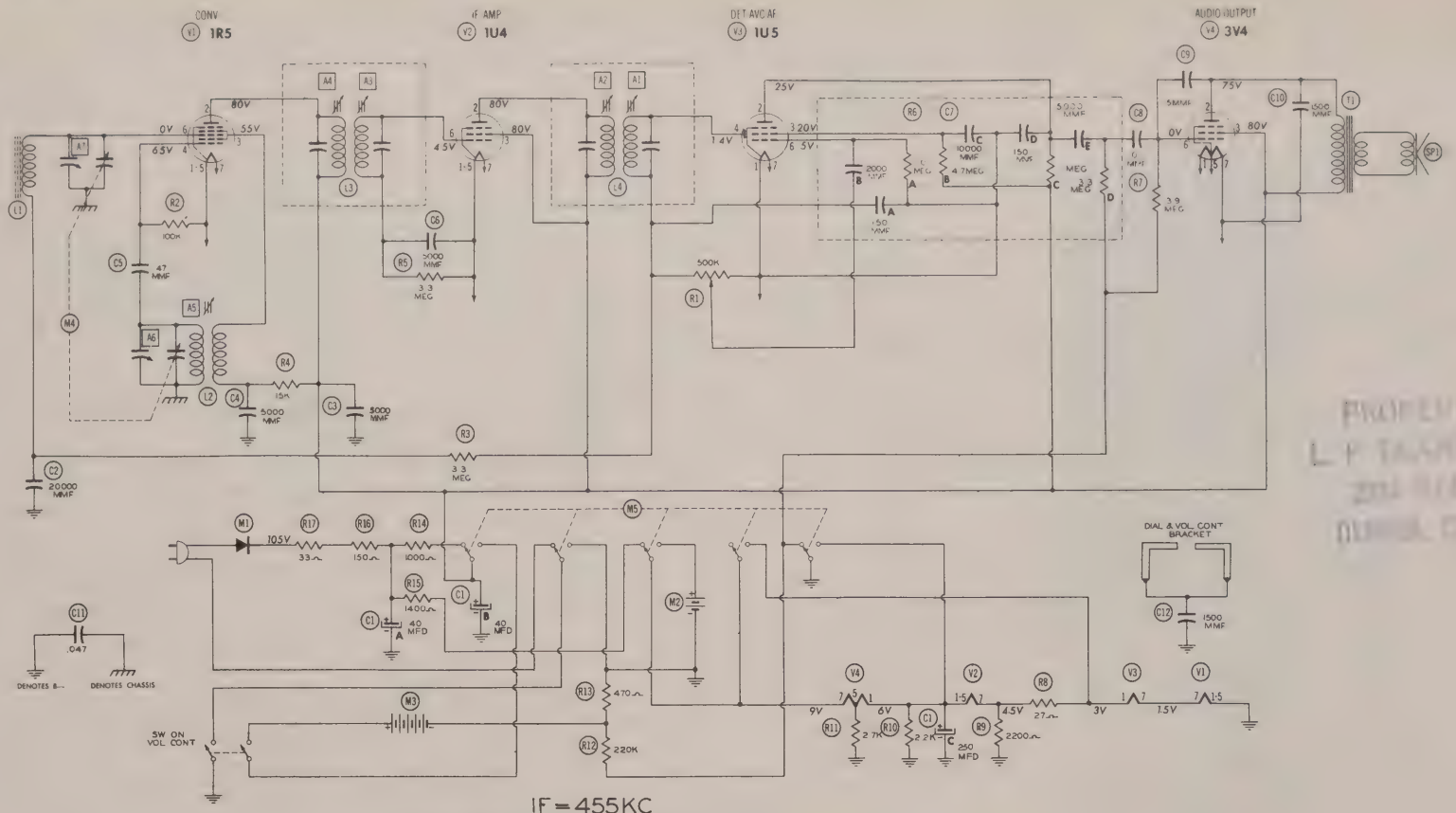
CAPEHART MODEL P-213 (Ch. CR-85)

CAPEHART MODEL P-213 (Ch. CR-85)



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0Ω	† 1. 2KΩ	† 16KΩ	100KΩ	0Ω	3. 8Meg	*
V 2	1U4	*	† 1. 2KΩ	† 1. 2KΩ	*	*	3. 3Meg	*
V 3	1U5	*	† 1Meg	† 4. 7Meg	500KΩ	*	10Meg	*
V 4	3V4	*	† 2KΩ	† 1. 2KΩ	† 1. 2KΩ	*	3. 9Meg	*

ALL VOLTAGES MEASURED WITH VTVM USING AC POWER SUPPLY.
† MEASURED FROM OUTPUT OF M1.
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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CORONADO
MODELS 35TV2-43-9023A, 45TV2-43-9023B

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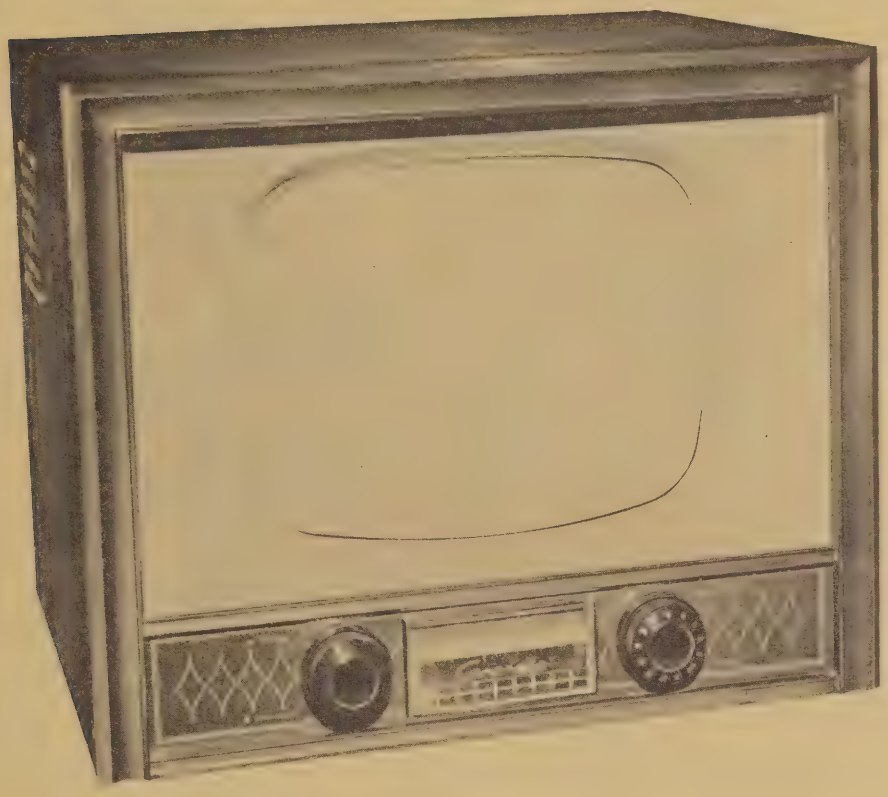

CORONADO
MODELS 35TV2-43-9023A, 45TV2-43-9023B

MODEL 45TV2-43-9023B

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DATE 3-54 SET 234 FOLDER 4

CORONADO MODELS 35TV2-43-9023A, 45TV2-43-9023B

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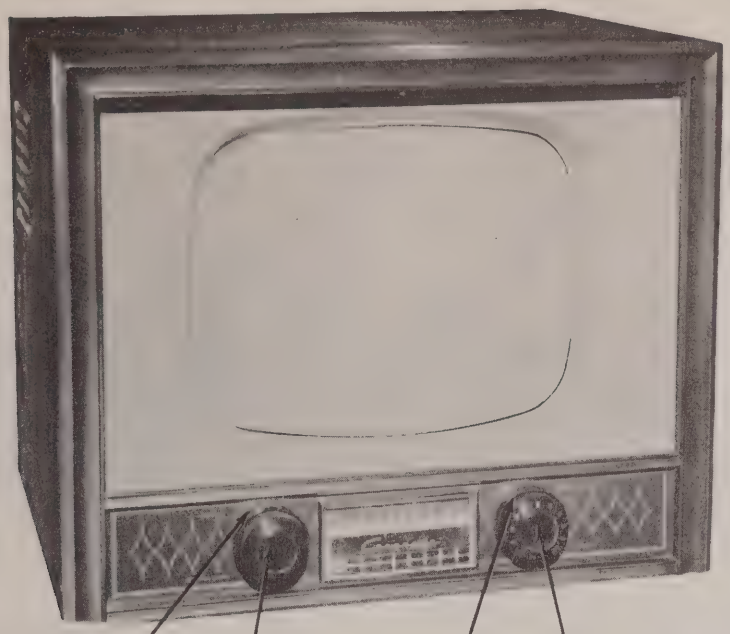

CORONADO 45TV2-43-9023B

TRADE NAME	Coronado Models 35TV2-43-9023A, 45TV2-43-9023B
SUPPLIER	Gamble-Skogmo, Inc., 15 N. 8th. St., Minneapolis, Minn.
TYPE SET	Television Receiver
TUBES	Twenty-Five
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.8 Amp. @ 117 Volts AC
TUNING RANGE–	Channels 2 thru 13 VHF, 14 thru 83UHF, Video IF 26.2MC, Sound IF 21.7MC (Intercarrier)

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CORONADO
MODELS 35TV2-43-9023A, 45TV2-43-9023B

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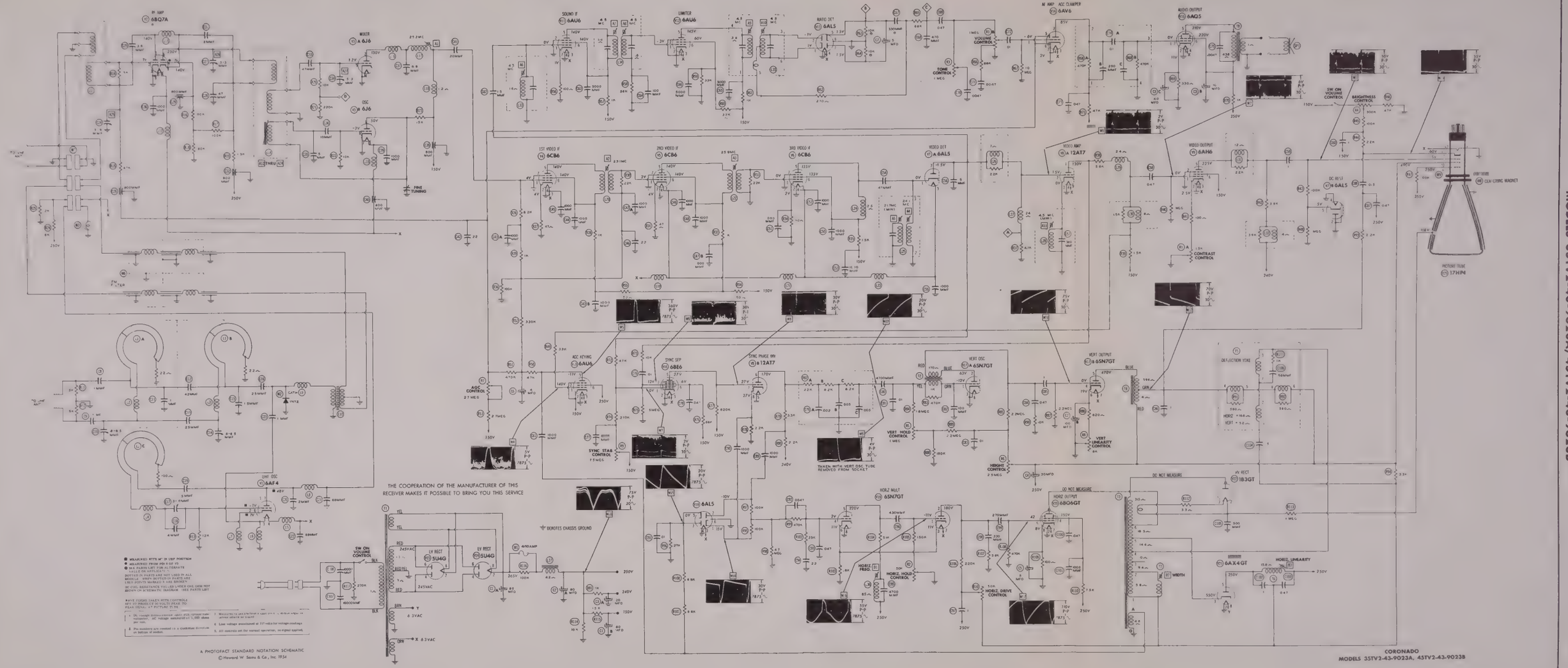

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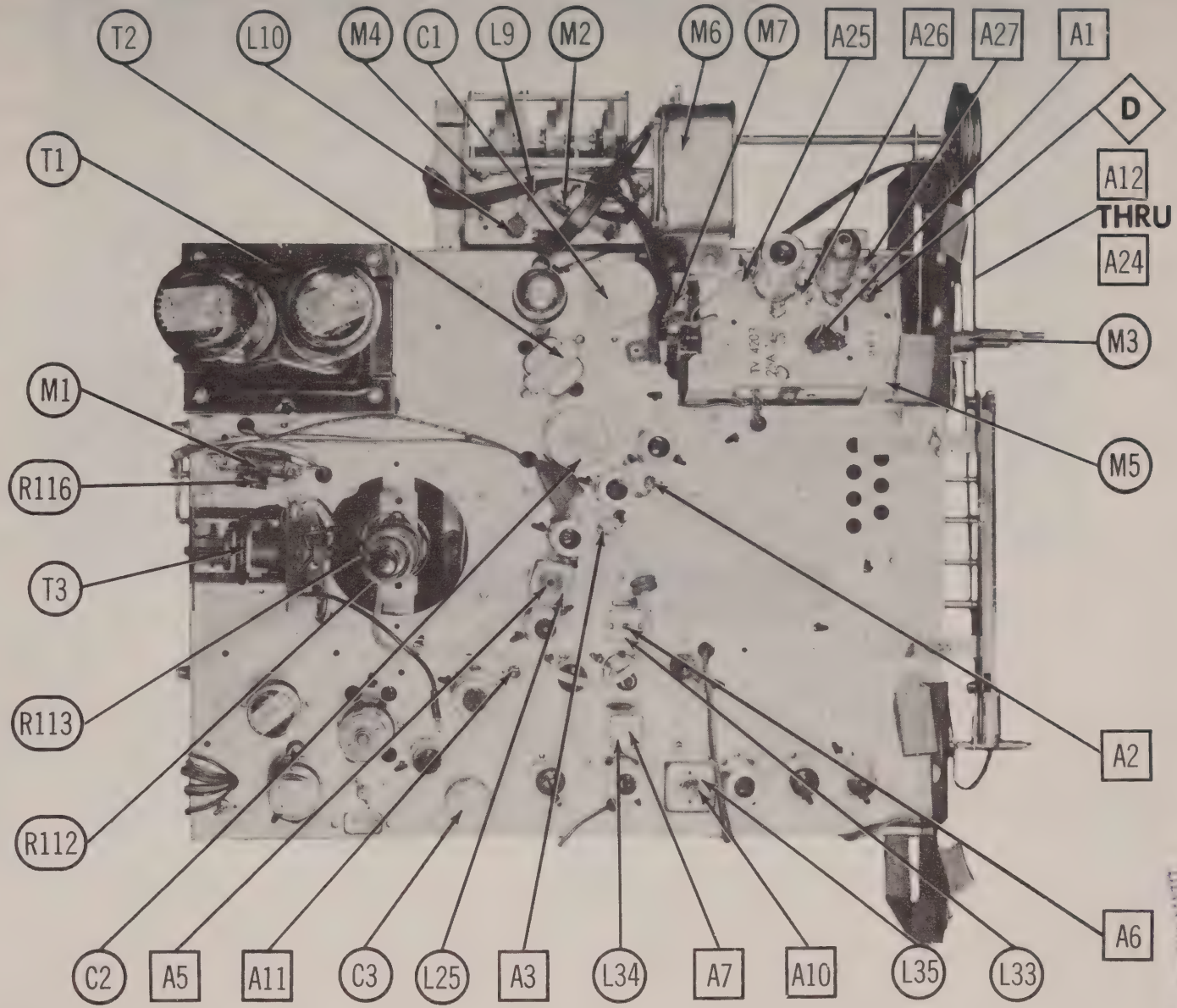

For tube location see tube placement chart page 5.

CHASSIS TOP VIEW

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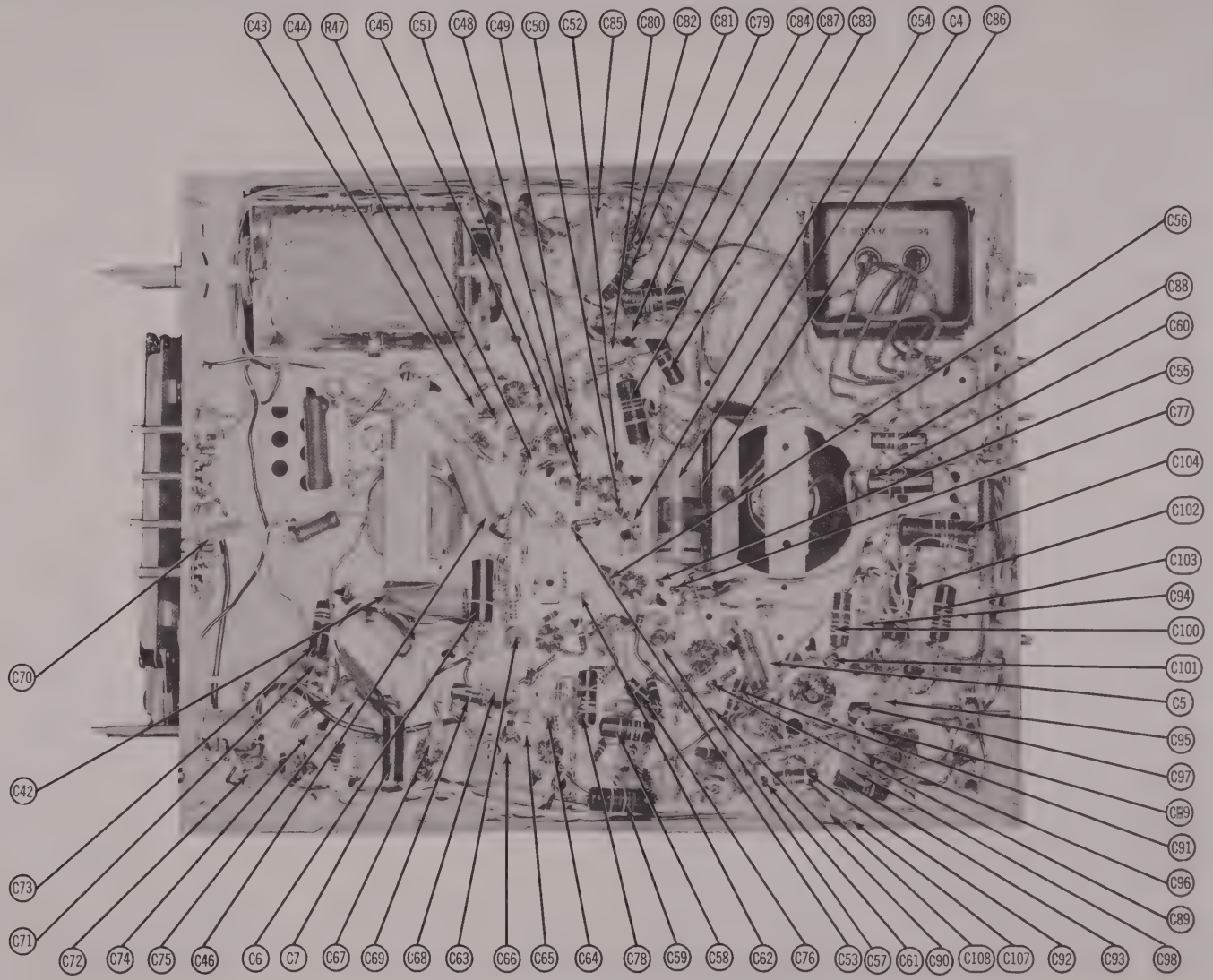

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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TUBE PLACEMENT CHART

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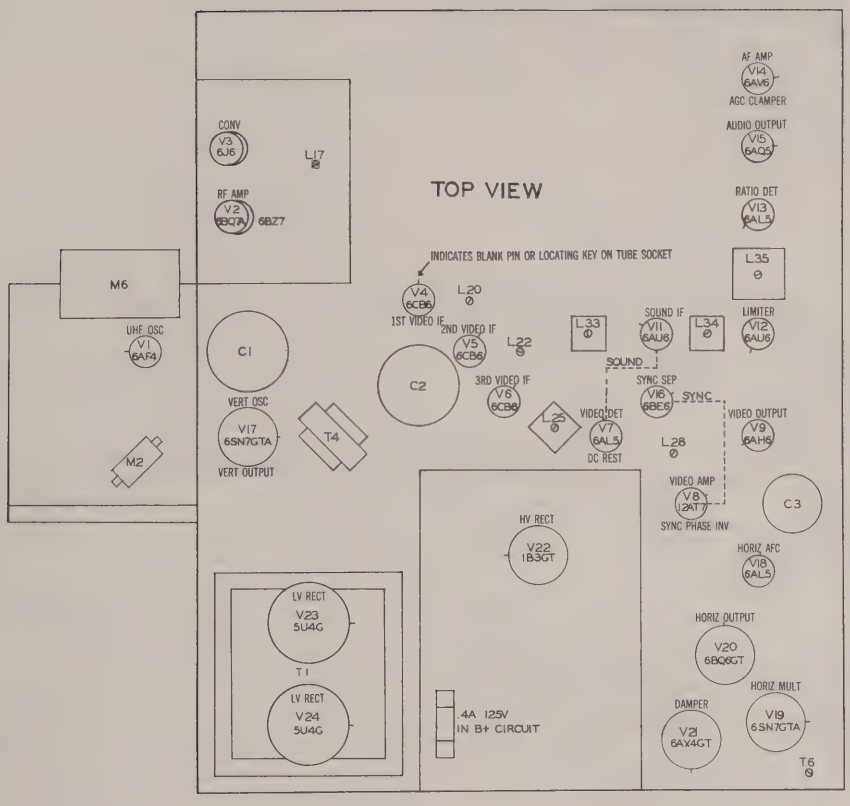


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V23, V24, Fuse (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7, (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V8, V9, V25**
Has pic, no sound - **V11, V12, V13, V14, V15**
Overloaded picture - **V10, V14**

SYNC FAILURE
No vert. sync - **V8, V17**
No horiz. sync - **V8, V18, V19**
No vert. or horiz. sync - **V8, V16**

SWEEP FAILURE
No raster, has sound - **V19, V20, V21, V22, V25**
No vertical deflection - **V17**
Poor vert. linearity or foldover - **V17**
Poor horiz. linearity or foldover - **V19, V20, V21**
Narrow picture - **V19, V20, V21, V22, V23, V24**
Vert. off freq. - **V8, V17**
Horiz. off freq. - **V8, V18, V19**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, V19.

VIDEO IF ALIGNMENT

Remove the converter tube (V3) from its socket and replace with a 6J6 which has Pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 4.5 volt bias supply to the ungrounded side of C46. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.2MC (Unmod)	Any	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	23.1MC	"	"	A2	"
3.	"	"	25.9MC	"	"	A3	"
4.	"	"	24.1MC	"	"	A4	"
5.	"	"	21.7MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.7MC 23.0MC 23.5MC 25.25MC 26.2MC	Any	Vert. Amp. thru 22KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig.1. If necessary, retouch A1 thru A4 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 7 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B). Common to chassis.	A6, A7, A8, A9	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point (C). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 7 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. thru 22KΩ to point (B). Low side to chassis.	A6, A7, A8, A9	Disconnect stabilizer capacitor C7. Adjust for curve of maximum amplitude and symmetry as in Fig.2.
8.	"	"	"	"	"	Vert. Amp. thru 22KΩ to point (C). Low side to chassis.	A10	Reconnect stabilizer capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Turn contrast control to maximum clockwise position. An alternate method of aligning the 4.5MC trap is to tune in a TV station and adjust A11. for minimum 4.5MC beat interference in the picture.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	10KΩ Resistor	High side thru 10KΩ to pin 7 (plate) of 6AL5 (V7). Low side to chassis.	Not used	4.5MC (400∿Mod)	Any	Vert. Amp. thru 22KΩ to pin 2 of picture tube. Low side to chassis.	A11	Adjust for MINIMUM 400∿ indication on scope.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and place the original 6J6 in its socket.
The oscillator adjustment screws for each channel are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel. Leave bias connected as under video IF alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 22KΩ to point (A). Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	
			124MC (10MC Swp)	122.25MC 126.75MC	UHF		A24	

ALIGNMENT INSTRUCTIONS (cont)

RF AND MIXER ALIGNMENT

Connect the negative lead of a 1.5 volt battery to the tuner AGC terminal. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 22KΩ to point (D). Low side to chassis.	A25,A26 A27	Adjust for response curve similar to Fig. 5 with markers above 90%.
12.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel make SLIGHT compromise adjustments of A25, A26 and A27 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

UHF TUNER ALIGNMENT

Alignment of this portion of the receiver is not recommended in the field due to circuit complexity. If the UHF tuner fails to operate satisfactorily after tube or crystal replacement, disconnect the tuner and return it to the factory for repair.

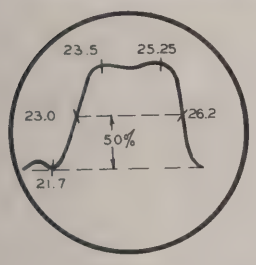


FIG.1

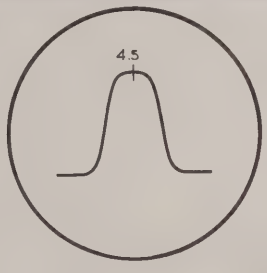


FIG.2

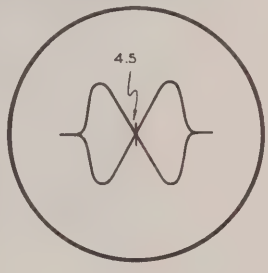


FIG.3

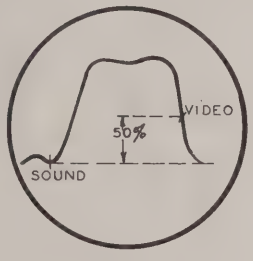


FIG.4

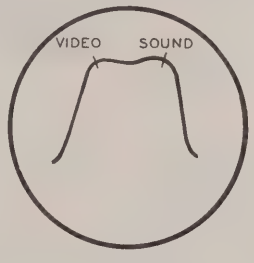
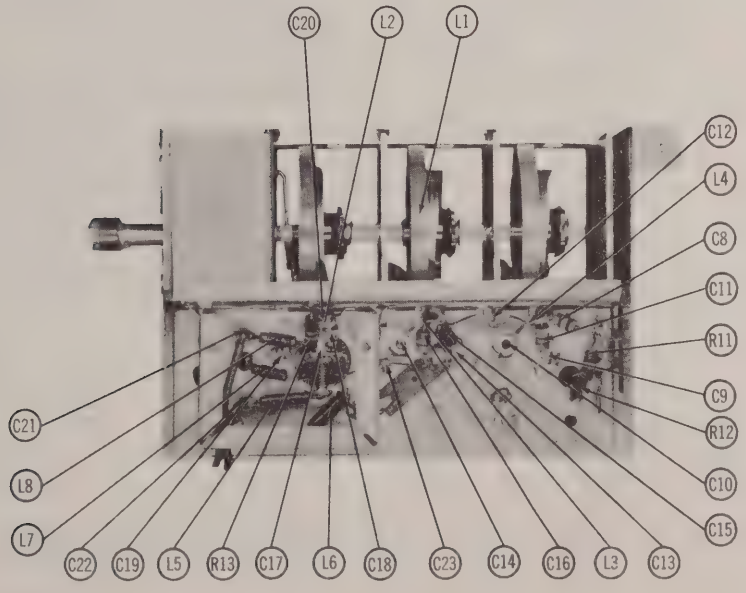


FIG.5



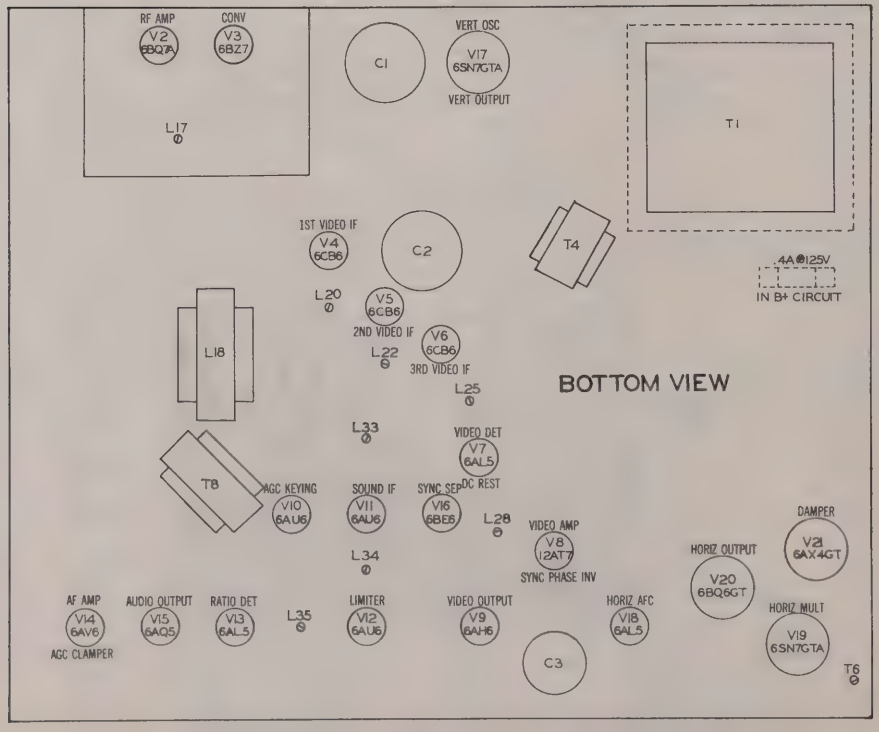
UHF TUNER

CORONADO
MODELS 35TV2-43-9023A, 45TV2-43-9023B

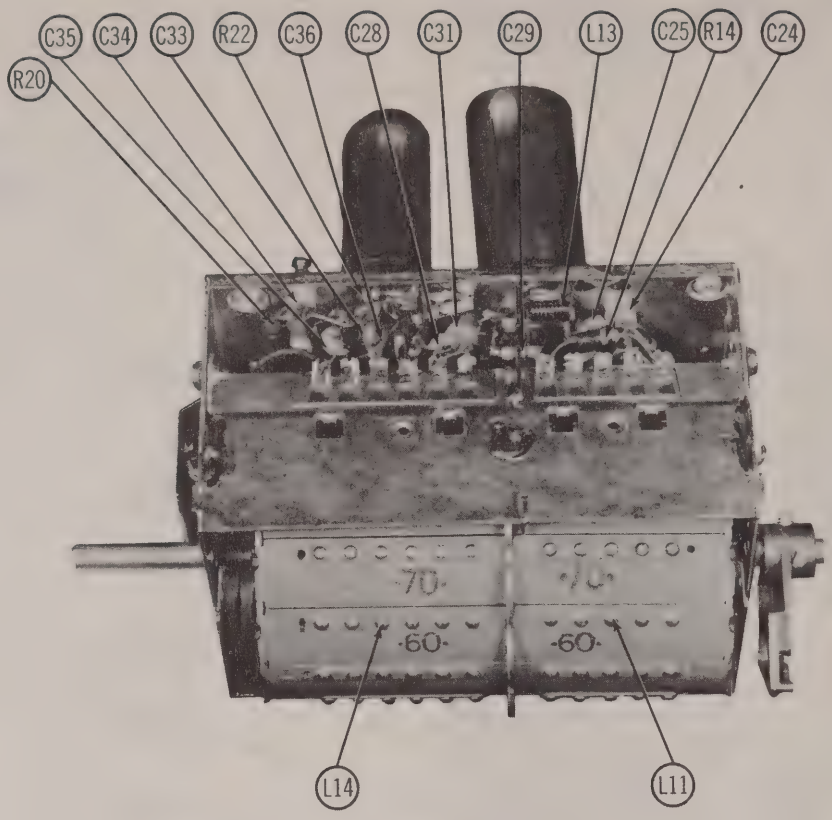
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†■6KΩ	12KΩ	0Ω	.1Ω	0Ω	12KΩ	†■6KΩ		
V 2	6BQ7A	INF	950KΩ	0Ω	.1Ω	0Ω	†1.5KΩ	160KΩ	INF	0Ω
V 3	6J6	†17KΩ	†1.5KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 4	6CB6	110KΩ	47Ω	.1Ω	0Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 5	6CB6	100KΩ	47Ω	.1Ω	0Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 6	6CB6	.3Ω	180Ω	.1Ω	0Ω	†3KΩ	†3KΩ	0Ω		
V 7	6AL5	.3Ω	0Ω	.1Ω	0Ω	1Meg	0Ω	4.7KΩ		
V 8	12AT7	†8.5KΩ	4.7KΩ	.3Ω	0Ω	0Ω	†6.5KΩ	†820KΩ	2.2KΩ	.1Ω
V 9	6AH6	1Meg	0Ω	.1Ω	0Ω	†5KΩ	†1.5KΩ	650Ω		
V 10	6AU6	†36KΩ	†1.5KΩ	.1Ω	0Ω	480KΩ	†45Ω	†1.5KΩ		
V 11	6AU6	1.6Ω	0Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	100Ω		
V 12	6AU6	56KΩ	0Ω	.1Ω	0Ω	†2.5KΩ	†20KΩ	0Ω		
V 13	6AL5	INF	INF	0Ω	.1Ω	10KΩ	0Ω	10KΩ		
V 14	6AV6	10Meg	0Ω	.1Ω	0Ω	900KΩ	900KΩ	†520KΩ		
V 15	6AQ5	470KΩ	330Ω	0Ω	.1Ω	†115KΩ	†1KΩ	470KΩ		
V 16	6BE6	50KΩ	0Ω	.1Ω	0Ω	†820KΩ	†70KΩ	1.5Meg		
V 17	6SN7GT	2.5Meg	♦3.3Meg	0Ω	2.2Meg	♦7.5KΩ	2.2KΩ	.1Ω	0Ω	
V 18	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	10KΩ	INF	10KΩ		
V 19	6SN7GT	170KΩ	♦300KΩ	1.8KΩ	5.2Meg	†5.2KΩ	1.8KΩ	.1Ω	0Ω	
V 20	6BQ6GT	6.8KΩ	0Ω	INF	†7.5KΩ	470KΩ	♦80KΩ	.1Ω	100Ω	TOP CAP ♦18Ω
V 21	6AX4GT	†45Ω	INF	2.5Meg	5.2Meg	†60Ω	†45Ω	0Ω	.1Ω	
V 22	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ♦333Ω
V 23	5U4G	INF	6.5KΩ	INF	13Ω	INF	13Ω	INF	6.5KΩ	
V 24	5U4G	INF	6.5KΩ	INF	13Ω	INF	13Ω	INF	6.5KΩ	
V 25	17HP4	0Ω	1.1Meg	PIN 6 †100KΩ	PIN 10 ♦3.3KΩ	PIN 11 †270KΩ	PIN 12 .1Ω			

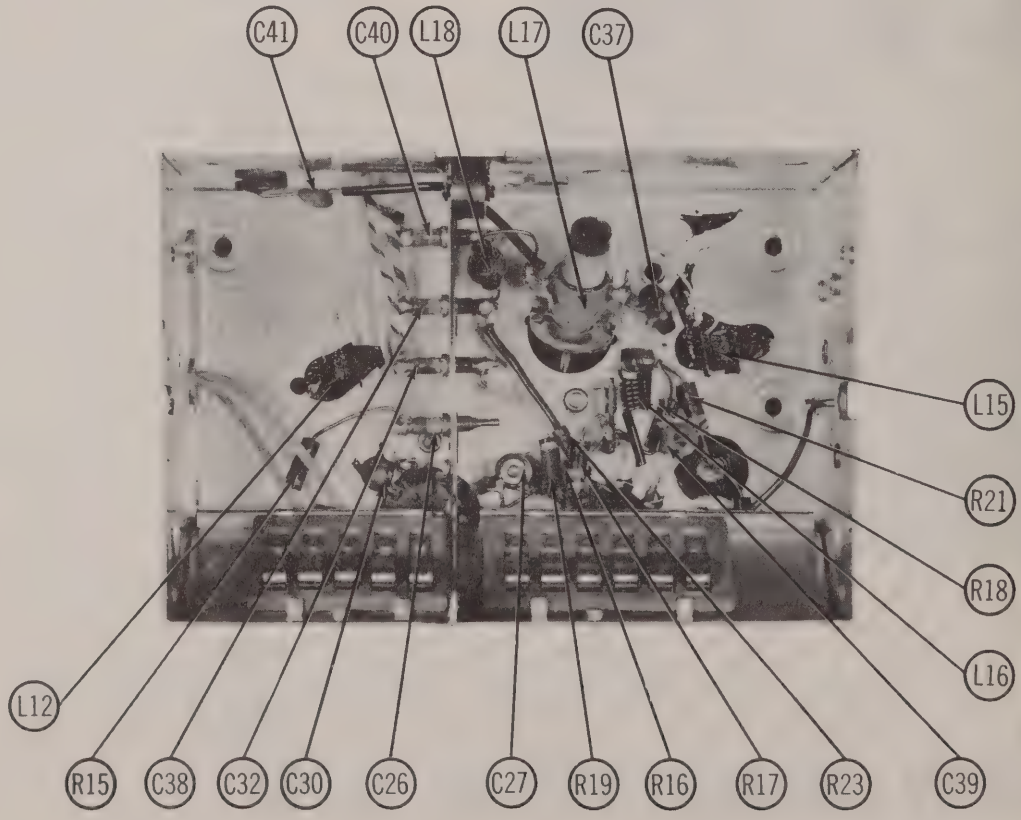
■ MEASURED IN UHF POSITION
♦ MEASURED FROM PIN 3 OF V21.
† MEASURED FROM PIN 2 OF V24



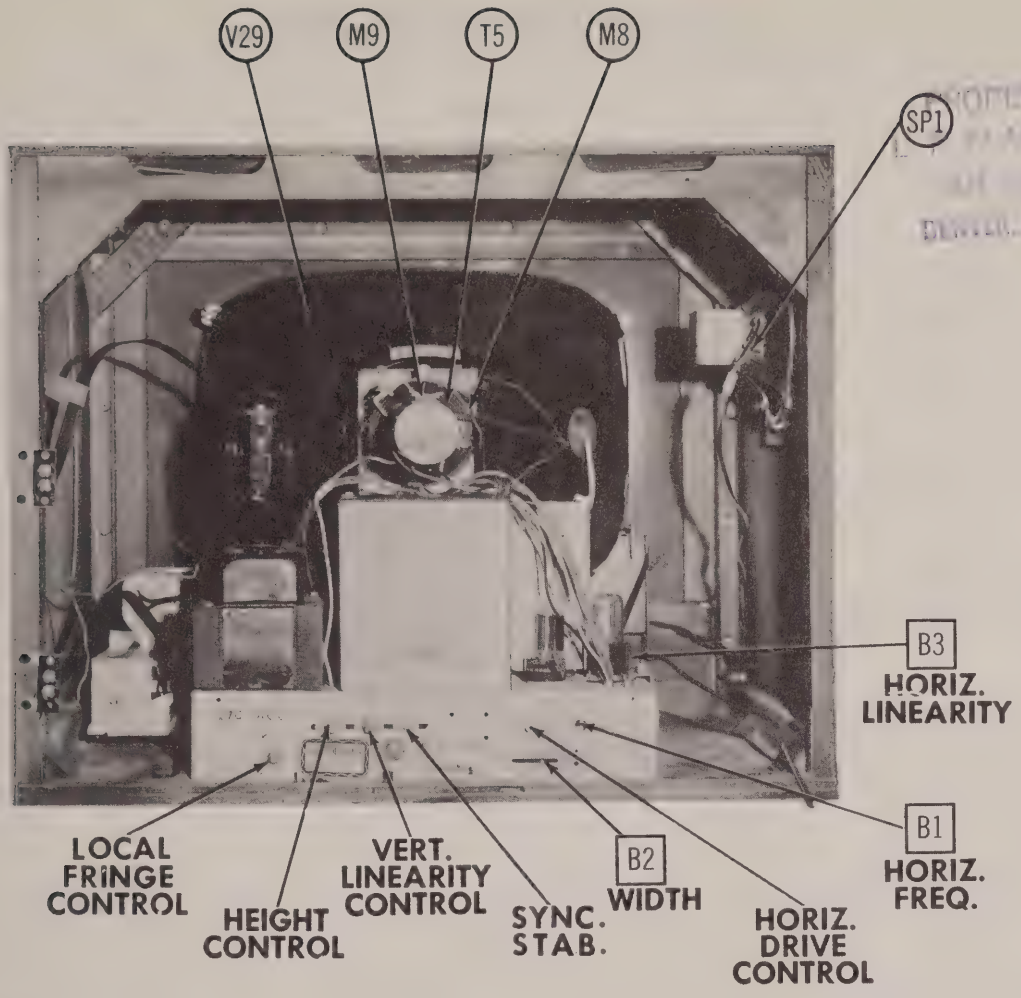
TUBE PLACEMENT CHART



VHF TUNER-RIGHT SIDE



VHF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

1. Adjust the horizontal hold control until picture falls into sync. Momentarily remove signal by switching off channel and back again. The picture should pull into sync and remain in sync through 90 degrees rotation of horizontal hold control. If picture does not remain in sync through 90 degrees rotation of horizontal hold control or sync pull in occurs at extreme settings of this control continue with step 2.

2. Set horizontal hold control to it mid-range position and adjust the horizontal frequency slug (B1) until the picture falls into sync. Recheck pull-in range as in step 1.

3. Turn the contrast control fully counter-clockwise. Turn up brightness control until picture appears washed out. Adjust width slug (B2) for a picture slightly wider than necessary to fill picture mask horizontally. Turn the horizontal drive control clockwise as far as possible without the presence of white bars near the center of the picture. Repeat step 1 and if necessary step 2.

4. Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right. If B3 required adjustment then readjustment of the horizontal drive control is necessary.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V19, V20, V21, V23 and V24. Check adjustment of the horizontal drive control, B2 and B3. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check C100, C102, C103, C104, R110, T3, T5A and other associated components.	Check C96, C98, C99, R106, R108, and other associated components.

DRIVE LINES

Check adjustment of the horizontal drive control. Check by substitution V19, V20 and V21. Check C98, C99, R106, R108, C100, C102, C103, C104, T3, T5A and other associated circuit components for failure or change of value.

COMPRESSED LEFT SIDE

Check by substitution V19, V20 and V21. Check adjustment of the horizontal drive control. Check adjustments B2 and B3. Check components associated with the horizontal output and damper stages especially T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

XMAS TREE EFFECT

Substitute V19. Check L36, C95, C96 and other associated components for failure or change of value.

PIE CRUST EFFECT

Check by substitution V19, V20 and V21. Check T3, T5A, C93 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V17. Check waveform W11.

If Satisfactory	If Unsatisfactory
Check T4, T5B and other associated circuit components.	Check C85, R85, R87, T2 and other associated circuit components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Follow procedure outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Substitute V17. Check C2B, T4, T5B and other associated circuit components.

COMPRESSED AT TOP

Substitute V17. Check C84, C85, T2, R85, R87 and other associated components.

FOLDS

Substitute V17. Check associated circuit components especially T2, T4 and T5B for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V16 and V8. Check components associated with V16 and V8B.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V8, V16 and V17. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check components associated with V17.	Check vertical integrator network and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V18 and V19. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check components associated with V19 especially C95 and C96.	Check C89, C90 and other associated components.

HORIZONTAL BENDING

Check by substitution V19 and V20. Check horizontal AFC filter network components (R98, R99, R102, C93, C92, and C94) for failure or change of value.

VIDEO

LOSS OF VIDEO

Check by substitution V8 and V9. Check picture tube and other associated circuit components.

SOUND BARS (4.5MC BEAT)

Check adjustment of tuner fine tuning. Check 4.5MC trap adjustment (A11). Check video IF alignment.

POOR CONTRAST

Check by substitution V7, V8 and V9. Check picture tube and other associated circuit components.

NEGATIVE PIX

Check by substitution V7, V8, V9 and V10. Check AGC network for component failure. Check picture tube and other associated components.

SMEAR

Check by substitution V7, V8 and V9. Check R38, R39, R40, R42, L26, L30, L31, L32, C58, C59, picture tube and other associated circuit components for failure or change of value.

WIDE BLACK BAR ACROSS PIX

Check V2, V3, V4, V5, V6, V7, V8 and V9 for heater to cathode leakage. In case of UHF check V1.

AUDIO

WEAK OR NO SOUND

Check by substitution V11, V12, V13, V14, and V15. Check stages of V14 and V15 using audio signal generator. Apply signal across R67.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V14 and V15 especially C74.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A10 for minimum buzz. If buzz is still objectionable substitute V13 and realign audio IF and detector stages. Check components associated with V13.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

PROPERTY OF
L. F. BLANKENSHIP
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2A	RF Amplifier	6BQ7A	6BQ7A	9AJ	
B	RF Amplifier	6BZ7	6BZ7	9AJ	
V3	Converter	6J6	6J6	7BF	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector-DC Restorer	6AL5	6AL5	6BT	
V8	Video Amplifier-Sync Phase Inv.	12AT7	12AT7	9A	
V9	Video Output	6AH6	6AH6	7BK	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	Sound IF Amp.	6AU6	6AU6	7BK	
V12	Limiter	6AU6	6AU6	7BK	
V13	Ratio Detector	6AL5	6AL5	6BT	
V14	AF Amplifier-AGC Clamper	6AV6	6AV6	7BT	
V15	Audio Output	6AQ5	6AQ5	7BZ	
V16	Sync Separator	6BE6	6BE6	7CH	
V17	Vert. Oscillator - Vert. Output	6SN7GTA	6SN7GTA	8BD	
V18	Horiz. AFC	6AL5	6AL5	6BT	
V19	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V20	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V21	Damper	6AX4GT	6AX4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	
V24	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: CORONADO PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	REPLACEMENT DATA: WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V25	17RP4/17HP4	17RP4/17HP4	17RP4/17HP4	17HP4/17HP4	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲80	300	45X397	AFH3-46		C037		FP378	TVL-2584	
B	▲60	300								
C2A	▲80	300	45X395	AFH3-142		C109		FP375	TVL-3764	
B	▲100	50								
C3A	■20	300	45X399	AFH3-137		C097		FP366	TVL-3682	
B	▲10	300								
C	40	50								
C4	30	400	45X393	PRS450/30		BR3045		TC77	TVA-1711	
C5	5	25	45X378	PRS150/4		BR550		TC30	TVA-1203	
C6	4	100	45X361	PRS150/4		BR415		TC40	TVA-1402	
C7	5	25	45X378	PRS150/4		BR550		TC30	TVA-1203	
C8	1									
C9	1									
C10	.8-6.5									
C11	1									
C12	.42									
C13	.25									
C14	.8-6.5									
C15	1.5									
C16	2.5									
C17	3-10									
C18	4									
C19	15									
C20	2									
C21	68									
C22	68									
C23	1									
C24	3-9		31B-207		829-3					
C25	3.6		CD8C3R6C						503C-D1	
C26	800		13D-153	EF-001	MFT-1000			CT565A		
C27	.5-3		31B-206		829-3					
C28	47		CD8Q470K	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C29	800		13D-196	EF-001	MFT-1000				503C-D1	
C30	1000		CD8X102Z	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C31	1.5		CD8C1R5M	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C32	800		13D-153	EF-001	MFT-1000				503C-D1	
C33	47		CD8Q470K	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C34	.5-3		31B-206		829-3			CT565A		
C35	5		CD8U050C							
C36	10		CD10C100K	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C37	6.8		CD8C6R8C	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C38	800		13D-153	EF-001	MFT-1000				503C-D1	
C39	1000		CD8X102Z	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C40	800		13D-153	EF-001	MFT-1000				503C-D1	
C41	120		13D-055	BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C42	.22	200	RCP10M2224M	P488-22		PTE4P22		PT4025	4TM-P22	
C43A	1000		80X3	BPD-2X001	DD2-102	TM5DD1	822-001	DCD-521	5HK-2D1	
B	1000									
C44	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C45	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C46	.22	200	RCP10M2224M	P488-22		PTE4P22		PT4025	2TM-P22	
C47A	1000		80X3	BPD-2X001	DD2-102	TM5DD1	822-001	DCD-521	5HK-2D1	
B	1000									
C48	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C49	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C50	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C51	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	

(CONT'D ON NEXT PAGE)

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C53	1000		80X1	BPD-001	DD-102	TMSD1	801-001	DC-521	5HK-D1	
C53	1000		80X1	BPD-001	DD-102	TMSD1	801-001	DC-521	5HK-D1	
C54	47		47X608	6147	D6-470		GPIK-470	UC-5347	5GA-Q47	
C55	1000		80X1	BPD-001	DD-102	TMSD1	801-001	DC-521	5HK-D1	
C56	5		47X562	SIHNP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C57	360	500	47X568							
C58	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT1147	4TM-S47	
C59	.1	400	RCP10M6104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C60	.1	400	RCP10M2104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C61	1000		80X1	BPD-001	DD-102	TMSD1	801-001	DC-521	5HK-D1	
C62	1.5		47X584	SIL.5NP0	TCZ-1.5		NP0K-IR5	ZT-555	5TCCB-V15	
C63	5000		47X507	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C64	100		47X504	SIDO	D6-101		GPIK-101	UC-531	5GA-T1	
C65	5000		47X507	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C66	5000		47X507	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C67	330	500	47X570	1469-00035						Note 1
C68	470	500	47X525	1469-0005		SR5T5		MCB245	M5-35	
C69	.047	200	RCP10M2473M	P488-047	DF-503	PTE4S47		PT1147	4TM-S47	
C70	.0047	400	RCP10M4472M	P668-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C71	.0047	400	RCP10M4472M	P668-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C72	.01	400	RCP10M4103M	P488-01	DE-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C73	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT1147	4TM-S47	
C74A	.01									
B	250		†76X5	†PA-112-3	†PC-80			†1404-01	†102C1	
C										
C75	.0047	600	RCP10M6472M	P668-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C76	.01	400	RCP10M4103M	P488-01	DE-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C77	1000		80X1	BPD-001	DD-102	TMSD1	801-001	DC-521	5HK-D1	
C78	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT1147	4TM-S47	
C79A	.005					PTE5D2		PT625		
B	.005		+76X7	+PC-110	+PC-100	(PTE5D6	+1405-01	PT625	+101C1	
C	.005					PTE5D6)		PT625		
C80	4700	500	47X543	1464-005		DDE5D5		MCB465	M5-25	
C81	.01	400	RCP10M4103M	P488-01	DE-103	PTE4S1	GP2-333-103	PT411	4TM-P1	
C82	100		47X504	SIDO	D6-101	TMST1	GPIK-101	UC-531	5GA-T1	
C83	.01	600	RCP10M6103M	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C84	.047	600	RCP10M6473M	P688-047		PTE6S47		PT6147	6TM-S47	
C85	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C86	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C87	.047	600	RCP10M6473M	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C88	.015	600	RCP10M6153M	P688-015						
C89	1000		80X1	BPD-001	DD-102	TMSD1	801-001	DC-531	5HK-D1	
C90	1000		80X1	BPD-001	DD-102	TMSD1	801-001	DC-521	5HK-D1	
C91	.01	400	RCP10M4103M	P488-01	DE-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C92	.0047	400	RCP10M4472M	P488-0047	D6-472	PTE4D47	GP2-333-472	PT4247	4TM-D47	
C93	.047	200	RCP10M2473M	P488-047	DF-503	PTE4S47		PT1147	4TM-S47	
C94	.22	200	RCP10M2224M	P488-22		PTE4P22		PT4025	4TM-P22	
C95	4700	500	47X543	1464-005		DDE5D5		MCB465	M5-25	
C96	430	500	RCM20B431K							
C97	.1	400	RCP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C98	330	500	47X570	1469-00035						
C99	270	500	RCM30A271K	1469-0003		SR5T3		MCB241	M3-32	
C100	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT1147	4TM-S47	
C101	1000		80X1	BPD-001	DD-102	TMSD1	801-001	DC-521	5HK-D1	
C102	.1	400	RCP10M4104M	P488-1		PTE4P1		PT401	4TM-P1	
C103	.047	400	RCP10M4473M	P488-047		PTE4S47		PT1147	4TM-S47	
C104	.15	400	RCP10M4154M	P488-15		PTE4P15		PT4015	4TM-P15	
C105	500	20000	47X560	HV20C	TV3-502	MMC-20T6	413-501	HV20035A	30GD6-T5	
C106	56	2000	47X598						30GA-Q56	
C107	10000		47X615	BPD-01	DD-103	TMS81	811-01	DC-511	5HK-S1	
C108	10000		47X615	BPD-01	DD-103	TMS81	811-01	DC-511	5HK-S1	

Note 1. Models using ratio detector trans. part #9A2389, use 1000MMF in this application (part #80Z1)
+ Items C79A, C79B, C79C, R63A, R63B, R63C are combined in one unit.
† Items C74A, C74B, C74C, R68A, R68B are combined in one unit.
When replacing items separately, C74B and C74C should total 250MMF.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	CORONADO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	78X15A	* QI-421	RTV-409		UF152R	Contrast (Panel)
B	1 Meg	½	Not Req.				UR16T25 †	Volume (Rear) tapped at 170K
C	Switch		Not Req.				US-26	Attach to R1B
R2A	50K	½	40X292A	QI-123	AG-44-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R2A
R3A	1 Meg	½	40X291E	QI-137	AG-8-S	AB-39	U-54	Tone
B	Shaft		Not R q.	NQ	RS-3/16	AK-4	Not Req.	Attach to R3A
R4A	500KΩ	½	40X290D	QI-133	AG-58-S	AB-59	U-50	Brightness
B	Shaft		Not Req.	NQ	RS-3/16	AK-4	Not Req.	Attach to R4A
R5A	1 Meg	½	40X291E	QI-137	AG-8-S	AB-39	U-54	Vert. Hold
B	Shaft		Not Req.	NQ	RS-3/16	AK-4	Not Req.	Attach to R5A
R6A	2.5Meg	½	B40X394	QI-239	AG-84-S	AB-83	SU-565	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	2.5Meg	½	B40X364	QI-239	AG-84-S	AB-83	SU-565	AGC
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	8000Ω	½	40X265A	QI-118	AG-37-S	AB-34	SU-30	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R8A
R9	7.5Meg	½	40X363					Style stability
R10A	250KΩ	½	B40X331A	QI-129	AG-52-S	AB-46	U-43	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R10A

† Universal replacement (Mallory exact duplicate Part No. UE2048).
* CONCENTRIKIT EQUIVALENT KIT K-2 (BASE ELEMENTS & SHAFTS B17-109 & P1-204 (Panel)
Bi3-137X & R2-216 (Resr) & SWITCH 76-2.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	CORONADO PART No.	IRC PART No.	NOTES
R11	1500Ω	½		BTS-1500	
R12	1500Ω	½		BTS-1500	
R13	12KΩ	½		BTS-12K	
R14	15KΩ	½	12A-004	BTS-15K	
R15	47KΩ	½	12A-039	BTS-47K	
R16	100KΩ	½	12A-094	BTS-100K	
R17	100KΩ 5%	½	12A-168	BTS-100K 5%	
R18	180KΩ	½	12A-187	BTS-180K	
R19	1500Ω	½	12A-163	BTS-1500	
R20	10KΩ	½	12A-040	BTS-10K	
R21	220KΩ	½	12A-041	BTS-220K	
R22	10KΩ	½	12A-040	BTS-10K	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	CORONADO PART No.	IRC PART No.	NOTES
R23	15KΩ	½		BTS-15K	
R24	8000Ω	6	43X279	1 5/4A-8000	
R25	12KΩ	2	B40423	BTS-12K	
R26	82000Ω 5%	½	B38223	BTS-8200 5%	
R27	47Ω 5%	½	B33470	BTS-47 5%	
R28	1000Ω	½	B85102	BTS-1000	
R29	1000Ω	½	B85102	BTS-1000	
R30	22KΩ 5%	½	B38223	BTS-22K 5%	
R31	47Ω 5%	½	B33470	BTS-47 5%	
R32	1000Ω	½	B85102	BTS-1000	
R33	22KΩ 5%	½	B38223	BTS-22K 5%	
R34	180Ω	½	B9418L	BTS-180	
R35	1500Ω	½	B64153	BTS-1500	
R36	100KΩ	½	B85104	BTS-100K	
R37	47000Ω 5%	½	B38472	BTS-4700 5%	
R38	5600Ω	½	C84562	BTA-5600	
R39	1500Ω	½	B84152	BTS-1500	
R40	1Meg	½	B84105	BTS-1Meg	
R41	100Ω	½	B84101	BTS-100	
R42	3900Ω 5%	1	C83392	BTA-3900 5%	
R43	100KΩ	½	B85104	BTS-100K	
R44	22KΩ	½	B84223	BTS-22K	
R45	100KΩ	½	B85104	BTS-100K	
R46	47KΩ	½	B85473	BTS-47K	
R47	100KΩ	½	B85104	BTS-100K	
R48	1Meg	½	B84105	BTS-1Meg	
R49	33KΩ	½	B84333	BTS-33K	
R50	47KΩ	½	B84473	BTS-47K	
R51	470KΩ	½	B84474	BTS-470K	
R52	330KΩ 5%	1	B83334	BTS-330K 5%	
R53	2.7Meg	½	B84275	BTS-2.7Meg	
R54	150Ω	½	B85151	BTS-150	
R55	150Ω	½	B85151	BTS-150	
R56	100Ω	½	B84101	BTS-100	
R57	1000Ω	½	B85102	BTS-1000	
R58	56KΩ	½	B84563	BTS-56K	
R59	33KΩ	½	B84333	BTS-33K	
R60	33KΩ	½	B84333	BTS-33K	Note 1
R61	1000Ω	½	B85102	BTS-1000	
R62	270Ω	½	B84271	BTS-270	
R63	10KΩ 5%	½		BTS-10K 5%	Note 2
R64	10KΩ 5%	½		BTS-10K 5%	Note 2
R65	68KΩ	½	B84683	BTS-68K	
R66	68KΩ	½	B84683	BTS-68K	
R67	10Meg	½	B85106	BTS-10Meg	
R68A	470KΩ	½		BTS-470K	
B	470KΩ	½	† 76X5	BTS-470K	
C	470KΩ	½		BTS-470K	
R69	3300Ω	1	C84331	BTA-330	
R70	1000Ω	2	B84102	BTB-1000	
R71	47KΩ	½	B85473	BTS-47K	
R72	47KΩ	½	B84473	BTS-47K	
R73	10KΩ	½	B84103	BTS-10K	
R74	270KΩ	½	B84274	BTS-270K	
R75	1.5Meg	½	B84155	BTS-1.5Meg	
R76	68KΩ	½	B84683	BTS-68K	
R77	820KΩ	½	B84824	BTS-820K	
R78	22000Ω 5%	1	B83222	BTS-2200 5%	
R79	3300Ω	½	B84332	BTS-3300	
R80	2200Ω 5%	1	B83222	BTS-2200 5%	
R81	1000Ω	1	C84103	BTA-1000	
R82A	22KΩ	½		BTS-22K	
B	8200Ω	½	+ 76X7	BTS-820D	
C	8200Ω	½		BTS-8200	
R83	470KΩ	½	B85474	BTS-470K	
R84	1.8Meg	½	B8418S	BTS-1.8 Meg	
R85	2.2Meg	½	B84225	BTS-2.2Meg	
R86	820Ω	½	B84201	BTS-820	
R87	2.2Meg	½	B84225	BTS-2.2Meg	
R88	180KΩ	½	B84184	BTS-180K	
R89	2.2Meg	½	B84235	BTS-2.2Meg	
R90	10KΩ	½	B84103	BTS-10K	
R91	560Ω	½	B84561	BTS-560	
R92	560Ω	½	B84561	BTS-560	
R93	2200Ω	½	B84222	BTS-2200	
R94	3300Ω	1	C84332	BTA-3300	
R95	100KΩ	½	B84104	BTS-100K	
R96	27KΩ	½	B84273	BTS-27K	
R97	100KΩ	½	B84104	BTS-100K	
R98	4.7Meg	½	B85474	BTS-4.7Meg	
R99	470KΩ	½	B85474	BTS-470K	
R100	6800Ω	½	C84682	BTA-6800	
R101	6800Ω	1	C84682	BTA-6800	
R102	33KΩ	½	B84333	BTS-33K	
R103	1.8KΩ 5%	½	B83182	BTS-1.8K 5%	
R104	5100Ω 5%	1	C83512	BTA-5100 5%	
R105	150KΩ 5%	½	B83154	BTS-150K	
R106	220KΩ 5%	½	B83224	BTS-220K 5%	
R107	5600Ω	½	B84562	BTS-5600	
R108	470KΩ	½	B84474	BTS-470K	
R109	100Ω	2	B84101		
R110	7500Ω	2	B84753	BTB-7500	
R111	1000Ω	½	B85102	BTS-1000	
R112	3.3Ω	½	43X328		
R113	1Meg	1	C85105	BTA-1Meg	
R114	10K	5	43X272	1 3/4A-10K	
R115	150Ω	15	43X275	2D-1500	
R116	100KΩ	2	D85104	BTB-100K	
R117	270KΩ	½	B85274	BTS-270K	

Note 1. Some models may use a 100KΩ resistor in this application.
Note 2. Some models may use a 10KΩ resistor in this application.
† Items R68A, R68B, C74A, C74B, C74C are combined in one unit.
+ Items R63A, R63B, R63C, C79A, C79B, C79C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	CORONADO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC	490VCT .250ADC	5VAC ⑨ 6A	53X354						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC ⑨1.2A	6.3VAC ⑨8.7A								

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING SEC.	CORONADO PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	170Ω	1000Ω	54X8	A-8125①	A-3003①	B8702①	A-97X①	209T1④ ⑭	Vert. Osc. Trans.
T3	367.88Ω	4.6Ω	53X329		KVO-9 & MWC-1 ②③		D-23 & WC-11② ④	232T1 ⑭ 212R1 ⑭	Horiz. Output Trans.
	tap ⑥	SEC. 2							
	.58Ω,	0Ω							
	9.98Ω,								
	19.9Ω,								
	34.3Ω,								
	52.8Ω								
T4	1600Ω		51X156	A-8141	A-3039	21B06	104X	226T1	Vert. Output Trans.
	tap ⑥								
	4.3Ω								
T5A	18.5Ω		9A2261	DY-9A⑤	MDF-72 ⑤	DF502 ⑤	Y-17 ⑮	31ID2	Horiz. Deflection Coils
B	53Ω								Vert.Deflection Coils
T6	15.6Ω		9A2262		MWC-8 ⑥		WC-12⑦	213R1	Horiz.Linearity Coil
T7	.6Ω		9A2183	WC-4⑧				20IR4⑮	Width

Ⓐ Mount under chassis or use original shield.
Ⓑ Drill new mounting holes.
① Connect original terminal #6 to new terminal #9, original #5 to new #7, original #4 to new #5, original #1 to new #1. Connect primary of MWC-1 across terminals #1 and #3. Secondary to AFC if picture is out of phase, reverse secondary.
② Connect terminal #8 to terminal #7, then connect original terminal #6 to new terminal #9, original #8 to new #7 and #8, original #4 to new #5, original #1 to new #3 Connect primary of WC-11 across terminals #1 & 3. Secondary to AFC if picture is out of phase, reverse secondary.
③ Use original horizontal deflection coil network, if necessary.
④ Enlarge mounting hole.
⑤ Connect to coded blue and green terminals.
⑥ Bend clip or use original slider and core.
⑦ Drill one new mounting hole.
⑧ Mount under chassis.
⑭ Use Fig. 4 of instruction booklet packed with unit for terminal connections.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	CORONADO PART No	Stancor PART No	Merit PART No	Triad PART No	Halldorson PART No	Thordarson PART No	NOTES
T8	5.5KΩ	3.7Ω	51X150A	A-3877	A-2930	S-3X	Z1001	TS-24S51	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V C IMP	CORONADO PART No.	JENSEN PART No.	QUAM PART No	NOTES
SP1	6"	PM	3.7Ω	12A504	8T-108 Mod P6-X	6A1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	CORONADO PART No.	MEISSNER PART No.	MERIT PART No	MILLER PART No	NOTES
L1A	UHF Ant. Coil	0Ω						
B	UHF Mixer Coil	0Ω						
C	UHF Osc. Coil	0Ω						
L2	UHF Ant. Coil and Inductor	0Ω						
L3	UHF Mixer Coil End Inductor	0Ω						
L4	UHF Osc. Coil End Inductor	0Ω						
L5	Fil. Choke	.3Ω						1.33 Microhenries
L6	Fil. Choke	.2Ω						1.33 Microhenries
L7	Cathode Choke	0Ω						.38 Microhenries
L8	RF Choke	0Ω						.38 Microhenries
L9	Parasitic Suppressor	0Ω						
L20	UHF IF Output Coil	0Ω	0Ω					Secondary tapped
L1A	VHF Ant. Coil	0ΩCT	0Ω	A9A2297-2				Channel 2
B	VHF Ant. Coil	0ΩCT	0Ω	A9A2297-3				Channel 3
C	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-4				Channel 4
D	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-5				Channel 5
E	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-6				Channel 6
F	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-7				Channel 7
G	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-8				Channel 8
H	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-9				Channel 9
I	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-10				Channel 10
J	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-11				Channel 11
K	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-12				Channel 12
L	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-13				Channel 13
M	UHF Ant. Coil Strip	0Ω CT	0Ω	A9A2297-91				UHF Position
L12	Fil. Choke	0Ω		34A-546				
L13	Neutr.C oil	0Ω		31B-296				
L14A	VHF RF, Mixer Grid & Osc.Coil	0Ω		A9A2298-2				Channel 2
B	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-3				Channel 3
C	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-4				Channel 4
D	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-5				Channel 5
E	VHF RF, Mixer Grid & Osc.Coil	0Ω		A9A2298-6				Channel 6
F	VHF R F, Mixer Grid & Osc. Coil	0Ω		A9A2298-7				Channel 7
G	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-8				Channel 8
H	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-9				Channel 9
I	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-10				Channel 10
J	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-11				Channel 11
K	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-12				Channel 12
L	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-13				Channel 13
M	VHF RF, Mixer Grid & Osc. Coil Strip	0Ω		A9A2298-91				UHF Position
L15	Fil. Choke	0Ω		34A-575				
L16	RF Choke	0Ω		31B-295				
L17	Ist. Video IF	.9Ω		31A-076				
L18	RF Choke	1.3Ω		31B-330				
L19	Fil. Choke	0Ω		9A2033	19-3001	TV-189	4602	1 Microhenry
L20	2nd. Video IF	.3Ω	.3Ω	9A2230	17-1063	TV-186	6249	
L21	Fil. Choke	0Ω		9A2033	19-3001	TV-189	4602	1 Microhenry
L22	3rd. Video IF	.3Ω	.3Ω	9A2230	17-1064	TV-186	6250	
L23	Fil. Choke	0Ω		9A2033	19-3001	TV-189	4602	1 Microhenry

CORONADO
MODELS 35TV2-43-9023A, 45TV2-43-9023B

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L24	RF Choke	2.5Ω		9A1979	19-3036	TV-180	4628	.36 Microhenry
L25	4th. Video IF	.2Ω		9A2226	17-1002	TV-101	6187	Includes trap
L26	Series Peaking Coil	7Ω		36A10	19-4060	TV-180 ■	6172 ■	60 Microhenries, wound on 22KΩ resistor
L27	Shunt Peaking Coil	24Ω		36A11	19-1923	TV-188	6174	500 Microhenries
L28	4.5MC Trap	.3Ω		9A2074	20-1004	TV-151	1470	
L29	Series Peaking Coil	2.4Ω		9A1979	19-3036	TV-180	6176	36 Microhenries
L30	Shunt Peaking Coil	8Ω		36A16	19-3075 ♦	TV-181 ♦	6172 ♦	80 Microhenries, wound on 1.5KΩ resistor
L31	Series Peaking Coil	12Ω		36A12	19-4160	TV-184 ■	4644 ■	160 Microhenries, wound on 22KΩ resistor
L32	Shunt Peaking Coil	14Ω		36A13	19-3180 †	TV-184 †	6154 †	190 Microhenries, wound on 3.9KΩ resistor
L33	1st. Sound IF	1.6Ω		9A2168	17-1031 ▲	TV-113 ‡	1470A **	
L34	2nd. Sound IF	1.4Ω	1.4Ω	9A2170		TV-113	6203	
L35	Ratio Det.	3.8Ω	.6ΩCT	9A2295 *	17-1033	TV-110	1468	Tertiary winding - .5Ω
L36	Horiz. Osc.	65Ω		9A2096	19-1576	TV-163	6210	

* Some Models use ratio det. part #9A2269 (has alphabetical terminal identification)
♦ Parallel with 1.5KΩ resistor
† Parallel with 3.9KΩ resistor
■ Parallel with 22KΩ resistor
▲ Drill mounting hole.
‡ Detune unused winding
** Add 47MMF capacitor externally.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: CORONADO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L37	.280ADC	42Ω	2.24 Hy.	52X91A	C-2326 ①		C-17X	C5037①	T-20C55

① Drill one new mounting hole.

FUSES

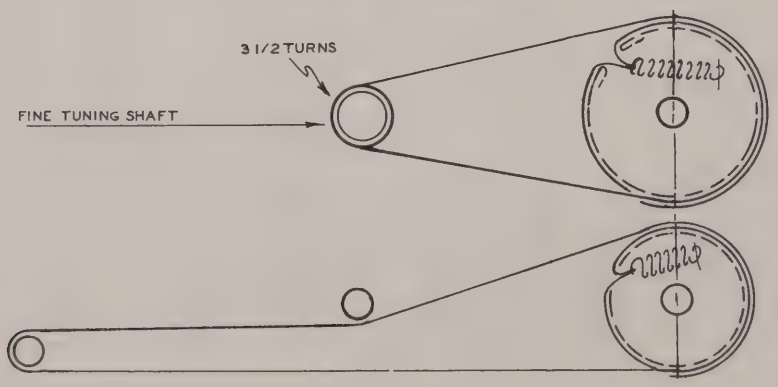
ITEM No.	TYPE	RATING	REPLACEMENT DATA: CORONADO PART No. FUSE	CORONADO PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG S/B	4/10A	16X147-3	16X146	313.400 (3AGS/B-4/10)	357001	MDL 4/10	4405

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: CORONADO PART No.	SYLVANIA PART No.		NOTES
M2	1N72		1N82 or 1N82A		UHF Mixer (clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M3	Dial light	7A32	# 51 bayonet (2) VHF & UHF channel lights
M4	Tuner	25A1105	UHF
M5	Tuner	25A1109	VHF
M6	Trap	52X92	FM filter unit
M7	Switch	2A430	UHF-VHF changeover
M8	Magnet	2A426	Centering device
M9	Magnet	2A421	Ion trap
	Knob	12A820-1	Fine tuning
	Knob	10A821-1	Contrast
	Knob	10A822-1	Channel selector
	Knob	10A779	Volume
	Safety glass	18X178	
	Mask	4X1217-1	Model 35TV-43-9023A
	Mask	4X1217-2	Model 45TV-43-9023B
	Dial glass	58X767	UHF
	Cabinet back	S-14X73	Assembly



UHF DRIVE CORD STRINGING

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1. If filaments light, substitute V23 and V24. Check fuse M1, C1A, C2A, L37 and other components that form the B+ filter and decoupling network.

SMALL AND/OR DIM PIX

Substitute V23 and V24. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V19, V20, V21 and V22. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check R112, R113, R110, C105, C100, C101, T3, T5A, and other associated circuit components.	Check C96, C99, R106, R108 and other associated circuit components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, V21, V22, V23 and V24. Check picture tube. Proceed as outlined under "Loss of High Voltage."

BLOOMING

Check by sbustitution V19, V20, V21, V22, V23, V24. Check T3, T5A, R112, R113, R110, C105, C100, C101, picture tube and other associated components for failure or change of value.

GENERAL

RASTER SOUND NO PIX

Follow procedure outlined under "Loss of Video".

RASTER PIX NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO PIX NO SOUND

Check by substitution V2, V3, V4, V5, V6, and V7. Check associated circuit components. In case of UHF check V1.

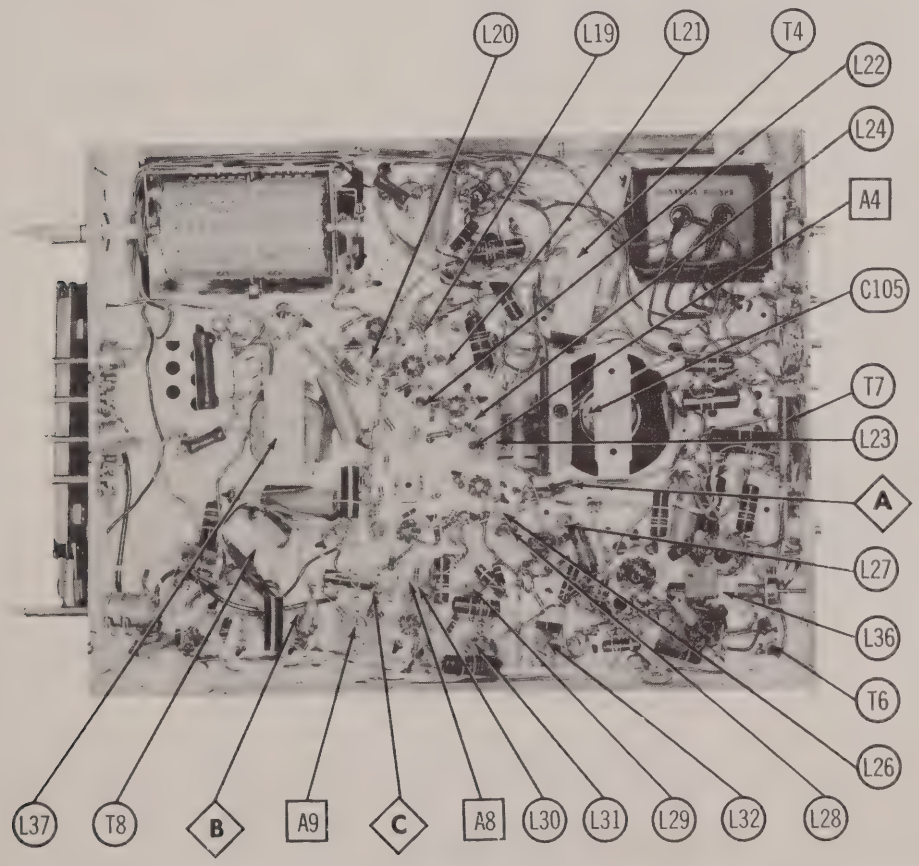
NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

INTERMITTENT STREAKS

Check video signal for interference pulses. Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

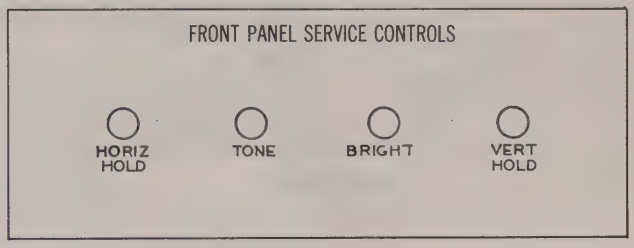
PICTURE TUBE SAFETY GLASS CLEANING

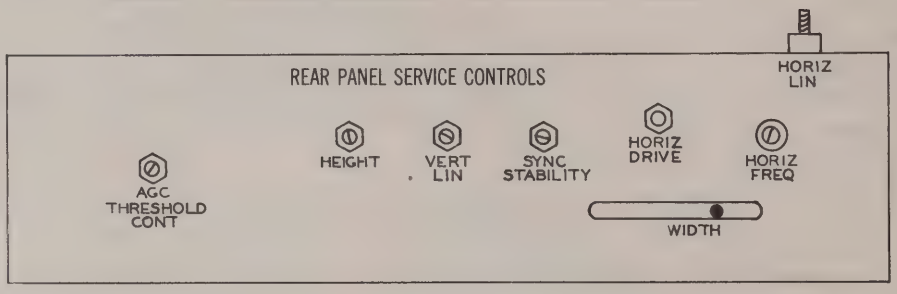
To clean safety glass, remove five wood screws holding metal strip at top of safety glass. Remove metal strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





SPECIAL ADJUSTMENTS:

AGC THRESHOLD CONTROL

Tune in the strongest TV station available.

Turn the AGC threshold clockwise until a buzz in the sound and a washed out picture appears, then turn the control slightly counter clockwise for clearest picture and best sound.

SYNC STABILITY CONTROL

With the picture locked in slowly turn the sync stability control clockwise until bending occurs at top of picture. Turn control SLIGHTLY counter clockwise until bending disappears. In general, the weaker the signal area the more clockwise the control should be turned.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal frequency slug (L36)until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ AD JUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L35) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of the picture tube located flush against the yoke cover. Turn the disc-like knob and at the same time rotate the ring around

DISASSEMBLY INSTRUCTIONS

Remove 4 push on type control knobs from front panel.

Remove 2 wood and 2 metal screws. Remove rear cover.

Disconnect transmission lines, speaker plugs, built-in antenna.

Remove 5 chassis bolts. Remove chassis.

Remove 4 speaker nuts. Remove speaker.

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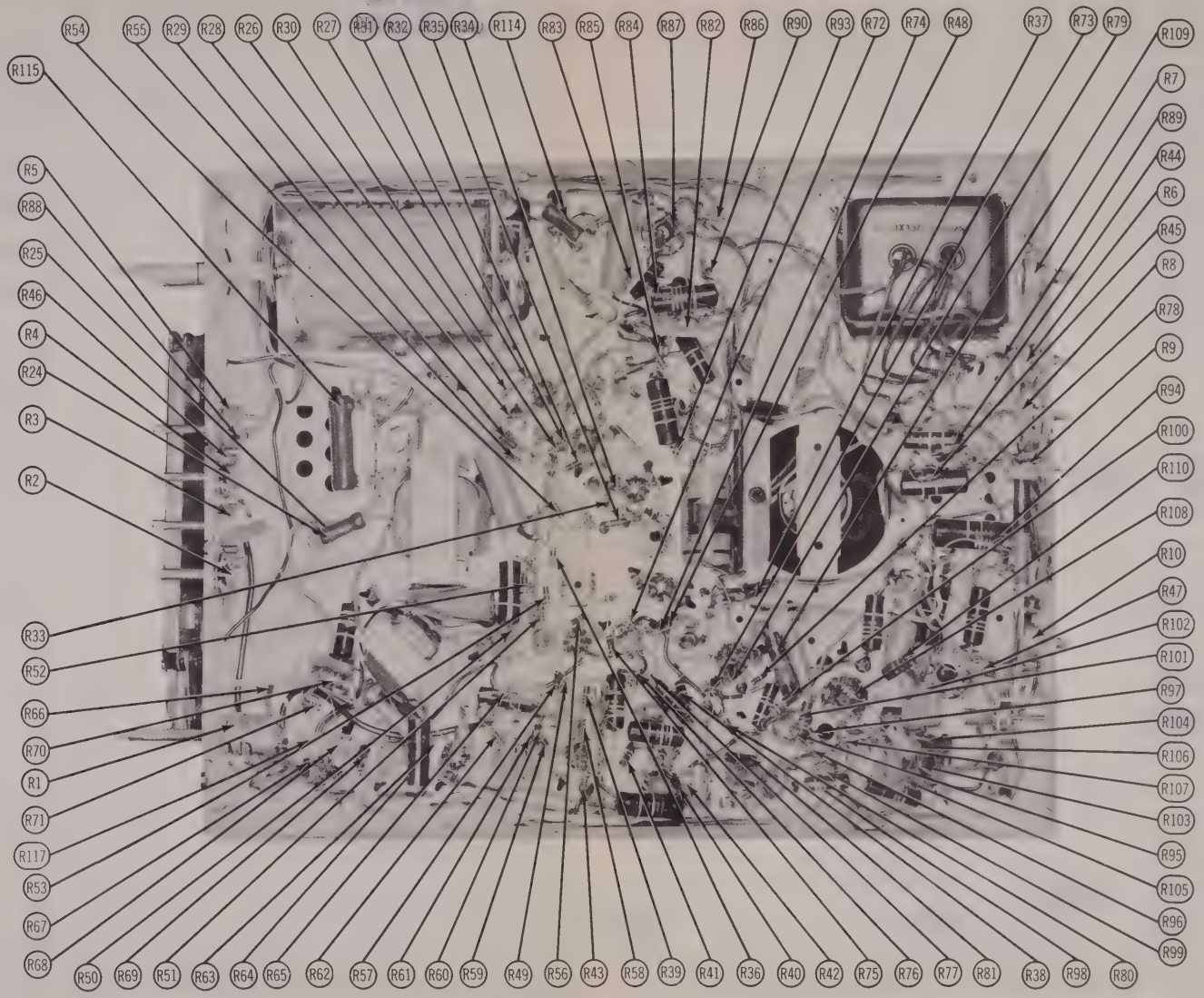

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PHOTOFACT* Folder

RETMA MEMBER

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F-24CDBH, CDBU, CDMH, CDMU (Ch. 412, -1)
F-27COBH, COBU, COMH, COMU (Ch. 416, -1)

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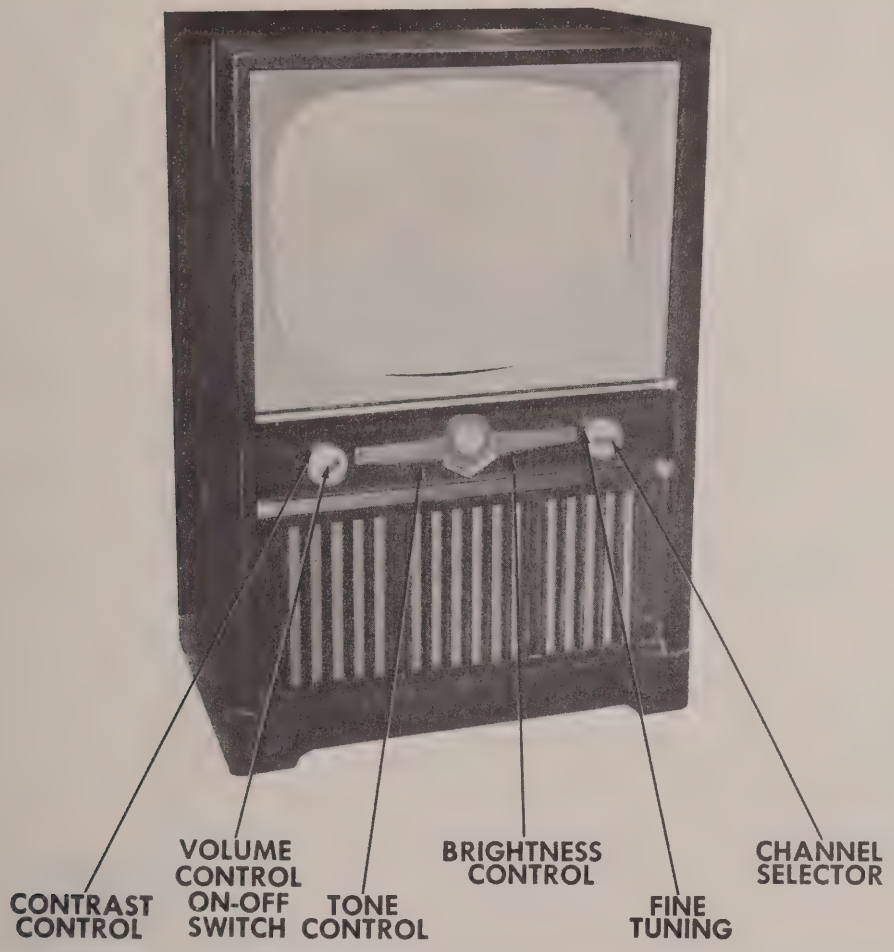

CROSLEY MODEL F-27COMH

TRADE NAME	Crosley	MODELS	CHASSIS
		F-24CDMH, F-24CDBH	412
		F-24CDMU, F-24CDBU	412-1
		F-27COMH, F-27COBH	416
		F-27COMU, F-27COBU	416-1
MANUFACTURER	Crosley Corp., 1329 Arlington St., Cincinnati, Ohio		
TYPE SET	Television Receiver		
TUBES	Twenty-two		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING 1.5 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 26.4MC, Sound IF 21.9MC (Intercarrier)		

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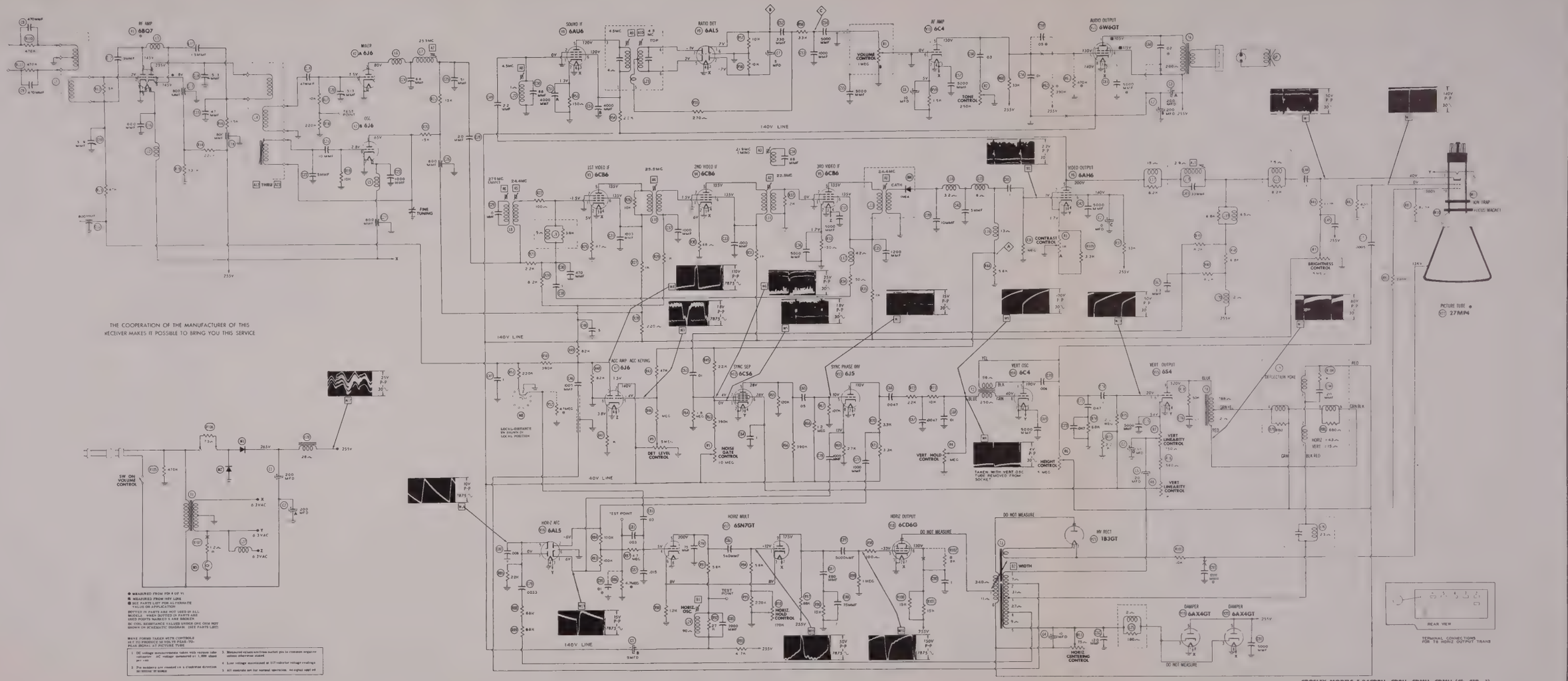

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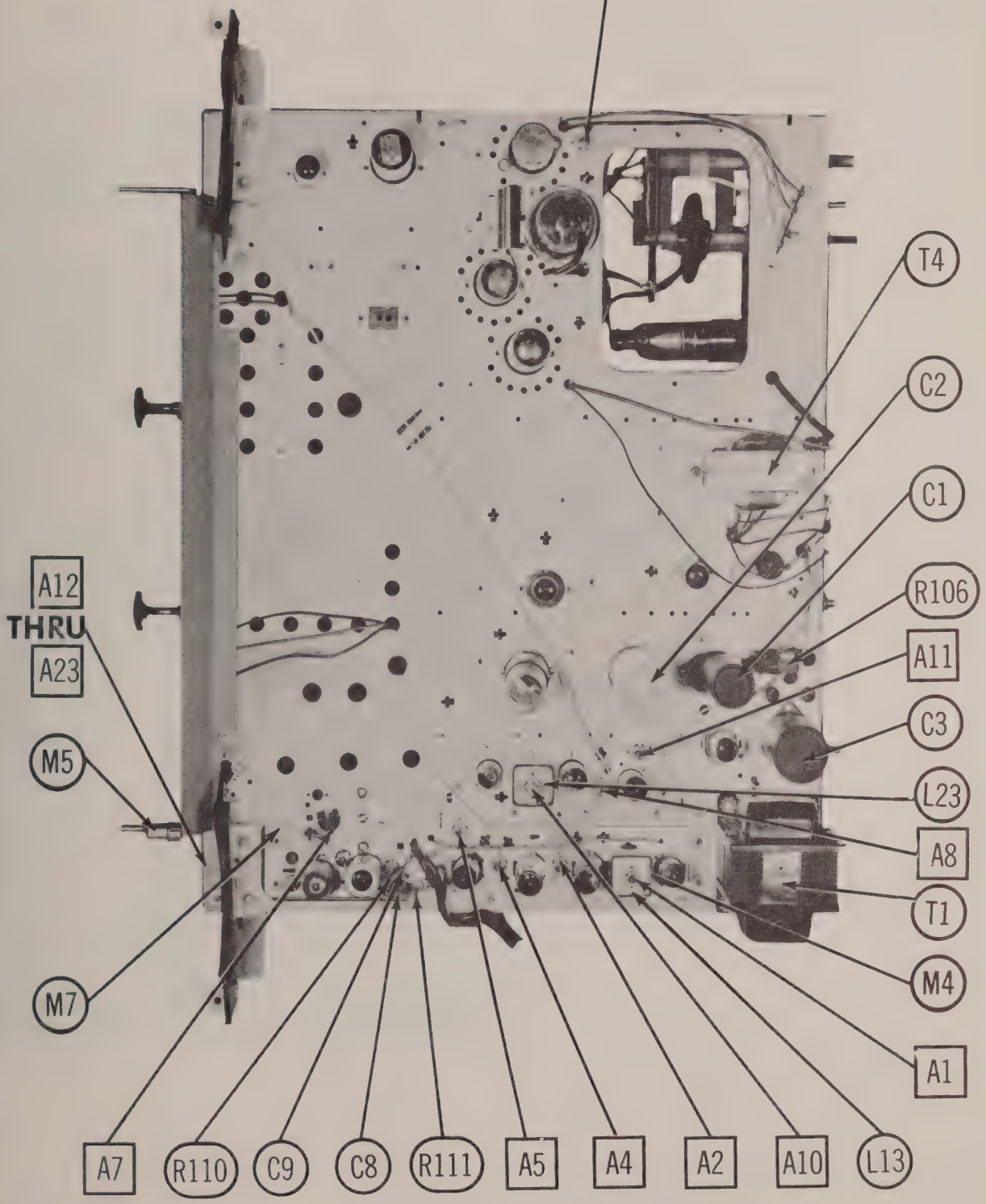

For tube location see tube placement chart page 5.

CHASSIS TOP VIEW

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CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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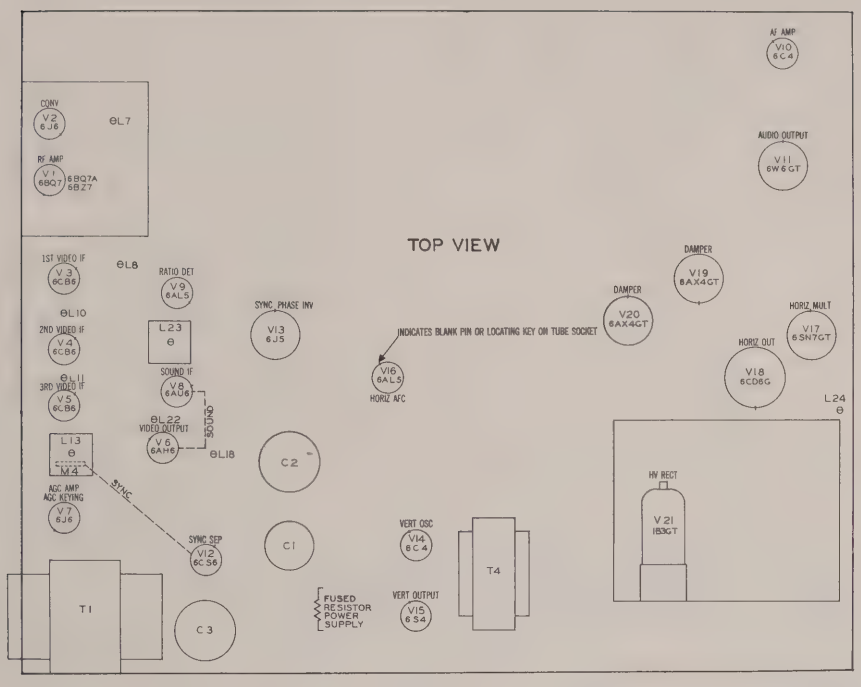
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster -**V2, V3, V4, V5, V6, V11**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V22**
Has pic, no sound - **V8, V9, V10, V11**
Overloaded picture - **V7**

SYNC FAILURE
No vert. sync - **V13, V14**
No horiz. sync - **V13, V16, V17**
No vert. or horiz. sync - **V12, V13**

SWEEP FAILURE
No raster, has sound - **V17, V18, V19, V20, V21, V22**
No vertical deflection - **V14, V15**
Poor vert. linearity or foldover - **V14, V15**
Poor horiz. linearity or foldover - **V17, V18, V19, V20**
Narrow picture - **V17, V18, V19, V20, V21, M1, M2**
Vert. off freq. - **V13, V14**
Horiz. off freq. - **V13, V16, V17**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect a 5000Ω potentiometer across a 4.5 volt battery. Connect the center tap of potentiometer to pin 1 (plate) of 6J6 (V7).
Connect positive lead to chassis.
Connect the DC probe of a VTVM to the ungrounded side of C48. Common to chassis. Adjust bias supply for -3.5 volts at ungrounded side of C48.
Set contrast control and noise gate control fully counter clockwise. Set local-distance switch to " local".

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24.4MC (Unmod)	Any	DC probe to point (A) Common to chassis.	A1	Adjust for maximum deflection. Attenuate signal generator to maintain not more than 2 volts at VTVM.
2.	"	"	22.9MC	"	"	A2	"
3.	"	"	21.9MC	"	"	A3	Reduce IF bias if necessary to adjust A3 for MINIMUM deflection. Repeat steps 2 and 3. Restore bias to -3.5 volts if necessary.
4.	"	"	25.5MC	"	"	A4	Adjust for maximum deflection. Attenuate signal generator to maintain not more than 2 volts at VTVM.
5.	"	"	24.4MC	"	"	A5	"
6.	"	"	27.9MC	"	"	A6	Reduce IF bias if necessary to adjust A6 for MINIMUM deflection. Repeat steps 5 and 6. Restore bias to -3.5 volts if necessary.
7.	"	"	25.5MC	"	"	A7	Connect a 1KΩ resistor in series with a .001MFD capacitor and connect this RC net across L8. Adjust A7 for maximum deflection. Remove RC net across L8.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	20.8MC 21.9MC 22.9MC 24.4MC 25.5MC 26.4MC 27.9MC	Any	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig.1. If necessary, retouch A1, A2, A4, A5 and A7 to obtain desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B). Common to chassis.	A8, A9	Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point (C). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A8, A9	Disconnect stabilizer capacitor C7. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
10.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A10	Reconnect stabilizer capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	.001MFD	High side to point (A). Low side to chassis.	Not used	4.5MC (400∿Mod)	Any	Vert. Amp. thru detector probe (Fig. 4) to pin 11 of picture tube. Low side to chassis.	All	Adjust for MINIMUM 400∿ indication on scope.

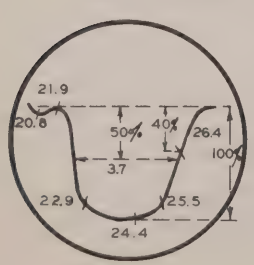


FIG. 1

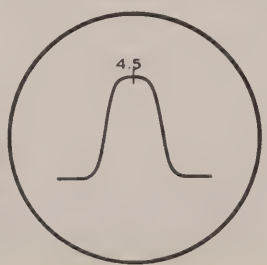


FIG. 2

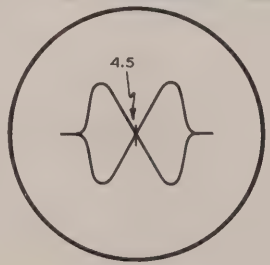


FIG. 3

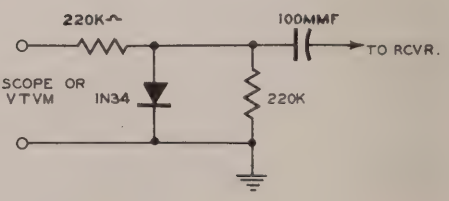


FIG. 4

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ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustment screws are reached thru a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead,	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A12	Adjust to place sound marker in trap notch and video marker as shown in Fig.5.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

RF AND MIXER ALIGNMENT

The RF and mixer portions of this receiver have been properly aligned at the factory and are very stable. Alignment of these portions should not be required in the field.

UHF CONVERTER ALIGNMENT

1. Remove the UHF converter from the receiver chassis.
2. In order that the converter will operate with tuning shaft in a fully counter clockwise position, it will be necessary to disengage the function switch shaft from the linkage which operates it and manually set the switch to the UHF position. To accomplish this, loosen the two set-screws which fasten the arm and hub assembly to the shaft. The switch should be turned clockwise to the UHF position and left in this position while aligning.
3. Connect UHF converter output leads to RF input terminals of VHF tuner.
4. Restore B+ and filament connections to same points on VHF receiver from which they were disconnected.
5. Mount UHF converter at right angles to TV chassis with one mounting screw. This will aid in keeping all leads as short as possible. Switch VHF tuner to channel 6.

The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
A VTVM or oscilloscope may be used as the indicating device. If a scope is used the signal generator should be modulated.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	Fig. 6	High side thru matching network (Fig.6) to ungrounded side of 1N72 (crystal term."B"). Low side to converter chassis.	82MC (Unmod)	UHF	DC probe to point (A). Common to chassis.	A24, A25	Adjust for maximum deflection. Remove matching network from crystal terminal "B".
14.	Fig. 7.	Across matching network (Fig.7) to UHF antenna terminals.	460MC	UHF tuning shaft fully counter clockwise	"	A26	Adjust for maximum deflection.
15.	"	"	904MC	UHF tuning shaft fully clockwise	"	A27	Adjust A27 (up or down) for maximum deflection.
16.	"	"	"	"	"	A28	Connect 0-10MA DC meter in circuit between coil and ground at point (D). Adjust for maximum crystal current. With normal line voltage of 117VAC, crystal current should not exceed 5MA at any setting of tuner shaft. At low line voltages the crystal current must not fall below .3MA at any setting of tuner shaft. Repeat steps 14 and 15 until maximum reading is obtained.
17.	"	"	460MC	UHF tuning shaft fully counter clockwise	"	A29	Adjust for maximum deflection.
18.	"	"	904MC	UHF tuning shaft fully clockwise	"	A30	Adjust (compress or expand coil) for maximum deflection. Repeat steps 17 and 18 until maximum deflection is obtained. Disconnect milliammeter and restore connection at point (D). Disconnect test equipment.
19.	Check function switch for proper operation. At full counter clockwise rotation of tuner shaft, all VHF position contacts must be fully made and all UHF contacts fully broken. All UHF position contacts must be fully made and all VHF contacts fully broken when tuner shaft is 7½" or more from maximum counter clockwise position, as shaft is rotated in a clockwise direction. Replace UHF converter on receiver chassis.						

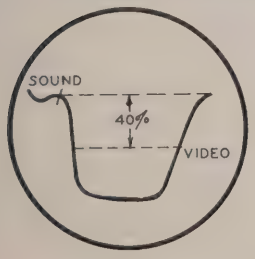


FIG.5

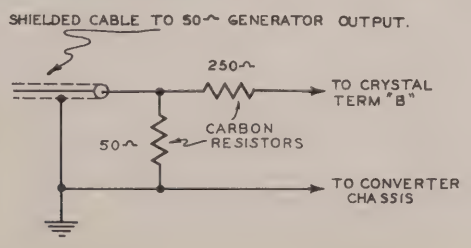


FIG.6

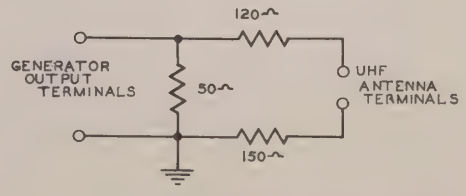
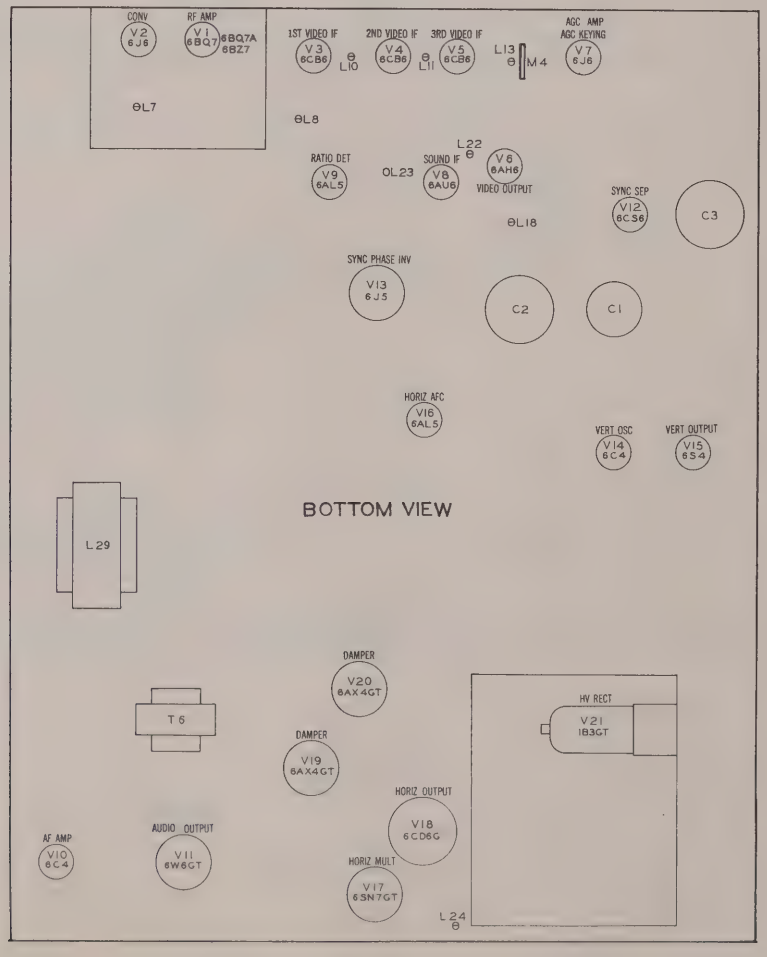


FIG.7

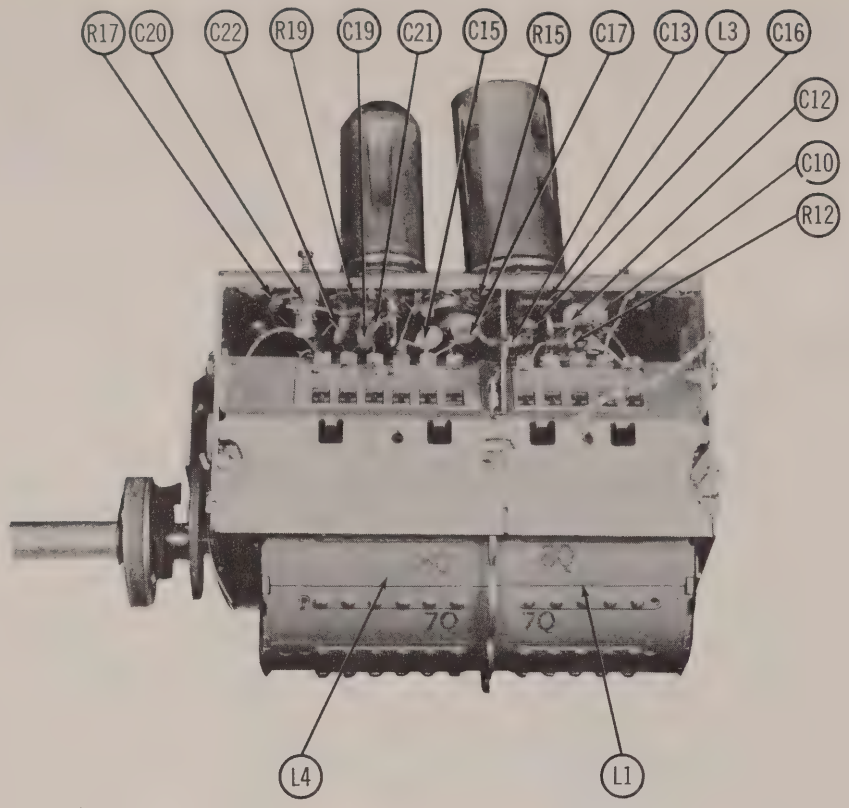
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	520KΩ	0Ω	.1Ω	0Ω	#1.5KΩ	150KΩ	INF	0Ω
V 2	6J6	†15KΩ	†15KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	170KΩ	47Ω	0Ω	.1Ω	†1.2KΩ	†1.2KΩ	0Ω		
V 4	6CB6	165KΩ	68Ω	0Ω	.1Ω	†1KΩ	†1KΩ	0Ω		
V 5	6CB6	.3Ω	150Ω	0Ω	.1Ω	†1KΩ	†1KΩ	0Ω		
V 6	6AH6	1Meg	100Ω	0Ω	.1Ω	#6.8KΩ	#33KΩ	100Ω		
V 7	6J6	82KΩ	†0Ω	.1Ω	0Ω	53KΩ	0Ω	1KΩ		
V 8	6AU6	1Ω	0Ω	.1Ω	0Ω	†2.2KΩ	†2.2KΩ	150Ω		
V 9	6AL5	10KΩ	10KΩ	.1Ω	0Ω	INF	0Ω	INF		
V 10	6C4	#33KΩ	INF	.1Ω	0Ω	#33KΩ	1Meg	1.5KΩ		
V 11	6W6GT	INF	.1Ω	#230Ω	#30Ω	#33KΩ	INF	0Ω	40KΩ	
V 12	6CS6	27KΩ	0Ω	0Ω	.1Ω	†390KΩ	2.2KΩ	1.8Meg		
V 13	6J5	INF	.1Ω	†6.6KΩ	INF	100KΩ	INF	0Ω	2.7KΩ	
V 14	6C4	♦2Meg	INF	.1Ω	0Ω	♦2Meg	700KΩ	0Ω		
V 15	6S4	INF	4KΩ	2.2Meg	.1Ω	0Ω	2.2Meg	INF	INF	♦2KΩ
V 16	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	22KΩ	0Ω	22KΩ		
V 17	6SN7GT	140KΩ	#68KΩ	1.2KΩ	9.4Meg	#10.4KΩ	1.2KΩ	.1Ω	0Ω	
V 18	6CB6G	INF	0Ω	0Ω	1Meg	1Meg	#4.8KΩ	.1Ω	#7.5KΩ	TOP CAP ♦22Ω
V 19	6AX4GT	INF	INF	1.2Meg	INF	#30Ω	INF	0Ω	.1Ω	
V 20	6AX4GT	INF	INF	1.2Meg	INF	#30Ω	INF	.1Ω	0Ω	
V 21	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP ♦360Ω
V 22	27MP4	0Ω	820KΩ	PIN 10 ♦390KΩ	PIN 11 †750KΩ	PIN 12 .1Ω				

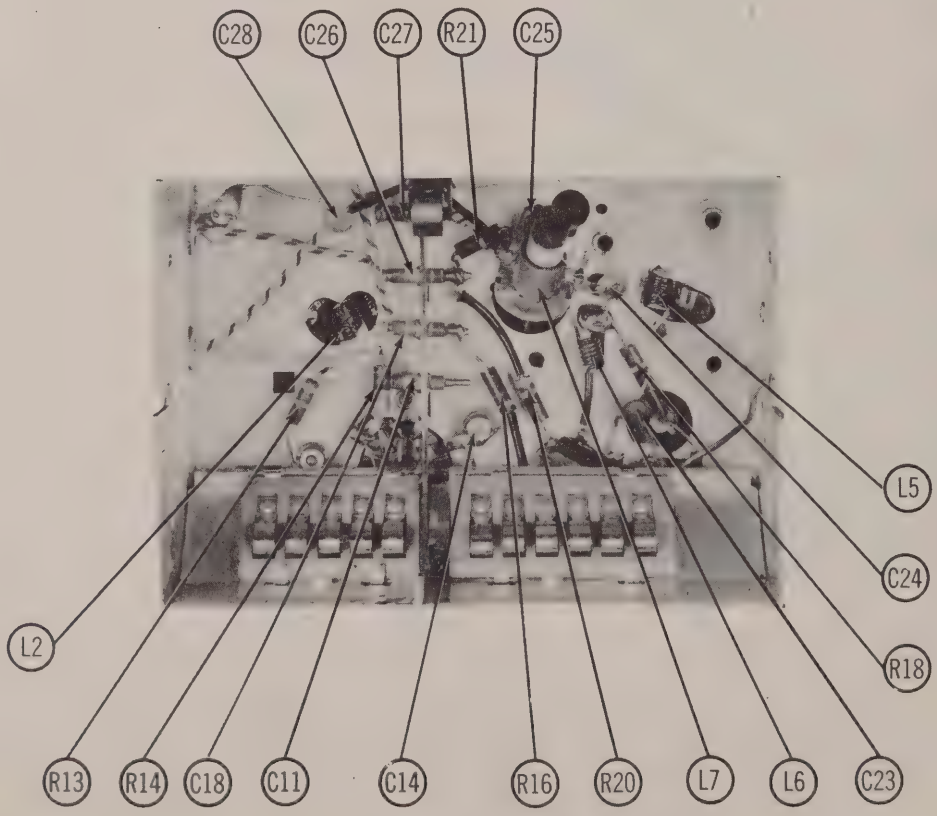
† MEASURED FROM 140 VOLT LINE
# MEASURED FROM OUTPUT OF M1
♦ MEASURED FROM PIN 3 OF V19 & V20



TUBE PLACEMENT CHART



VHF TUNER-RIGHT SIDE



VHF TUNER-BOTTOM VIEW

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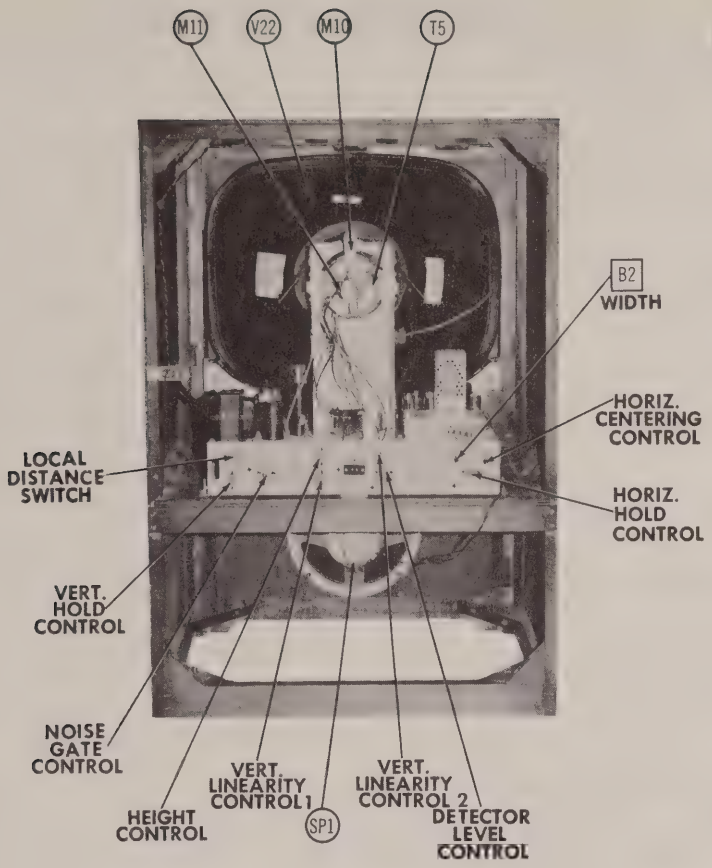


CABINET—REAR VIEW

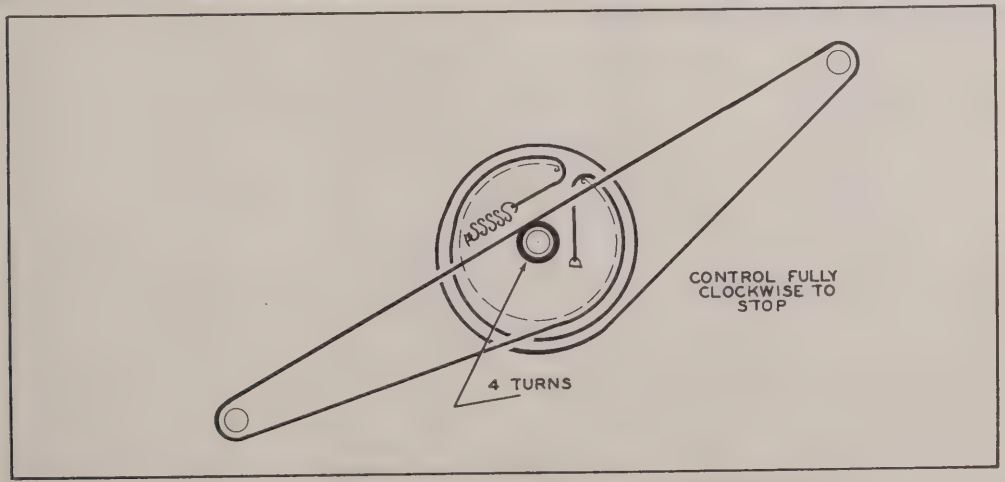
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

If horizontal hold control is too critical, adjust as follows:

1. Connect the DC Probe of a VTVM to the junction of R83 and R84. Common to chassis.
2. Short Pin 5 (cathode) of 6AL5 (V16) to chassis and adjust VTVM to zero.
3. Remove short from Pin 5 of V16. Do not readjust VTVM.
4. Connect a .1MFD, 600V capacitor from junction of horizontal oscillator coil (L24) and R91 to chassis.
5. Adjust horizontal hold control for zero on VTVM.
6. Remove .1MFD capacitor from junction of L24 and R91 to chassis. Do not change setting of horizontal hold control.
7. Adjust horizontal oscillator slug (B1) for zero on VTVM. Remove VTVM and check pull in range of horizontal hold control which should be effective for approximately 50 degrees of rotation.

Adjust width control core for a picture slightly wider than necessary to fill the picture mask horizontally.



UHF DRIVE CORD STRINGING

SET 234 FOLDER 5

TROUBLE SHOOTING AIDS

CAUTION

To remove shock hazzard and prevent damage to receiver and/or test equipment, use an isotation transformer between receiver and power line.

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V17, V18, V19 and V20. Check adjustment B2. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check C90, R100, R101, T3, T5A and other associated circuit components.	Check C86, C87, C88, C89, R97, R99 and other associated components.

DRIVE LINES

Check by substitution V17, V18, V19 and V20. Check T3, T5A, C90, C87, C88, C89, R97, R99, R100, R101 and other associated circuit components for failure or change of value.

COMPRESSED LEFT SIDE

Check by substitution V18, V19 and V20. Check horizontal output and damper circuit components especially T3 and T5A for failure or change of value.

FOLDS

Follow Procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V17, V18, V19 and V20. Check C82 and other associated circuit components.

XMAS TREE EFFECT

Substitute V17. Check C84, C85, C86, L24 and other associated circuit components.

VERTICAL

LOSS OF SWEEP

Check by substitution V14 and V15. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B and other associated components.	Check C72, C73, C74, R75, R6 and other associated components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss Of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V14 and V15. Check C75, C2D, T4, T5B and other associated circuit components.

COMPRESSED AT TOP

Check by substitution V14 and V15. Check T2, C72, C73, C74, R75, R6 and other associated circuit components.

FOLDS

Substitute V14 and V15. Check associated circuit components for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V12 and V13. Check associated circuit components for failure or change of value.

LOSS OF VERTICAL SYNC- HORIZONTAL SYNC SATISFACTORY

Check by substitution V12, V13 and V14. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check components associated with V14.	Check vertical integrator network and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Check by substitution V16 and V17. Check waveform W13.

If Satisfactory	If Unsatisfactory
Check components that form the AFC network. Check components that are associated with V17.	Check C77, C78, R83, R84 and other associated circuit components.

HORIZONTAL BENDING

Check by substitution V16, V17 and V18. Check horizontal AFC filter network components (C81, C82, R86, R87).

VIDEO

LOSS OF VIDEO

Check C44, R41, picture tube and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best picture and sound. Check adjustment A11. Check video IF alignment.

POOR CONTRAST

Substitute V6. Check video detector crystal and assembly. Check picture tube and other associated circuit components.

NEGATIVE PIX

Check by substitution V6 and V7. Check picture tube and other associated components. Check the AGC network for proper operation.

SMEAR

Substitute V6. Check video detector assembly. Check C41, C44, R36, R38, R41, L19, L21, picture tube and other associated components for failure or change of value.

WIDE BLACK BAR ACROSS PIX

Check V1, V2, V3, V4, V5 and V6 for heater to cathode leakage. Check filter capacitors for open.

AUDIO

WEAK OR NO SOUND

Check by substitution V8, V9, V10 and V11. Check stages of V10 and V11 using audio signal generator. Apply signal across R1B.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V10 and V11.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A10 for minimum buzz. If still objectionable, substitute V9 and realign the audio IF and ratio detector stages. Check C7.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1A	RF Amplifier	6BQ7	6BQ7	9AJ	
B	RF Amplifier	6BQ7A	6BQ7A	9AJ	
C	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	6AH6	6AH6	7BK	
V7	AGC Amp. -				
	AGC Keying	6J6	6J6	7BF	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AF Amplifier	6C4	6C4	6BG	
V11	Audio Output	6W6GT	6W6GT	7S	
V12	Sync Separator	6CS6	6CS6	7CH	
V13	Sync Phase Inv.	6J5	6J5	6Q	
V14	Vert. Oscillator	6C4	6C4	6BG	
V15	Vert. Output	6S4	6S4	9AC	
V16	Horiz. AFC	6AL5	6AL5	6BT	
V17	Horiz. Mult	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6CD6G	6CD6G	5BT	
V19	Damper	6AX4GT	6AX4GT	4CG	
V20	Damper	6AX4GT	6AX4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: CROSLEY PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V22A	27MP4				12M	
B	24CP4	24CP4			12N	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CROSLEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	200	150	155911-1	AFHS1-70		XA004		FP117 & TC49	R1437	
C2A	200	150	155910-1			D110		FP419.4	R1438	
B	■200	150						TCD49		
C	▲10	300								
D	▲30	150								
C3A	▲200	150	155426-1	AFHS2-109		B078		FP216.1	TVL-2444	
B	▲5	150								
C4	10	10	156054	PRS25/10		BR102		TC22	TVA-1204	
C5	20	600	156021-1	PRS600/10		BRHV620			R1466	
				PRS600/10						
C6	10	50	154104-1	PRS50/10		BR105		TC32	TVA-1304	
C7	5	50	154103-1	PRS150/4		BR550		TC30	TVA-1303	
C8	470	2000	156201-1	HVD30-00047					20GA-T47	
C9	470	2000	156201-1	HVD30-00047					20GA-T47	
C10	3-9		156906-16		829-10					
C11	800		156906-17	EF-001	MFT-1000				503C-D1	
C12	3		156906-9							
C13	800		156906-1	EF-001	MFT-1000				503C-D1	
C14	.5-3		156906-5		829-3			CT565A		
C15	47		156906-4	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C16	1000		156906-2	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C17	1.5		156906-3	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C18	800		156906-17	EF-001	MFT-1000				503C-D1	
C19	47		156906-4	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C20	.5-3		156906-5		829-3			CT565A		
C21	10		156906-12	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C22	5		156906-10							
C23	1000		156906-2	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C24	6.8		156906-8	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C25	51		156906-14							
C26	800		156906-17	EF-001	MFT-1000				503C-D1	
C27	800		156906-17	EF-001	MFT-1000				503C-D1	
C28	120		156906-15	BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C29	110	500	137499-37							
C30	470		156201-3	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C31	1000		144675-28	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C32	1000		144675-28	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C33	1000		144675-28	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C34	68	500	137499-33	1469-00007		5R5Q7			MS-47	
C35	1200		156201-4	SI1200	D6-122		GP2L-122		5GA-D12	
C36	5000		144675-2	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C37	5000		144675-2	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C38	.1	200	39001-19	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C39	10		137727-135	SI10	D6-100		GP1K-100	UC-541	5GA-Q1	
C40	5		137727-103	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C41	.1	200	39001-19	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C42	5000		144675-2	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C43	33		137727-126	SI33N080						
C44	.1	400	39001-19	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C45	.1	400	39001-19	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C46	1000	2000	156201-2	HVD30-001					20GA-D1	
C47	.1	200	39001-19	P288-1	DF-104	PJ2P1		PT401	2TM-S1	
C48	.5	25	154157-1	P288-5		PJ2P5		PT405	2TM-P5	
C49	2.2		154100-4	SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C50	68		137727-133							
C51A	4000		144675-6	BPD-2X004	D6-402	TM5DD4	GP2-333-402	DCD-524	5HK-2D4	
B	4000				D6-402		GP2-333-402			
C52	330		137727-129	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C53	1000		144675-28	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C54	5000		144675-2	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C55	5000		144675-2	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	CROSLEY Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C56	.01	400	39001-13	P488-01	DS-103	PTE451	GP2-333-103	PT411	4TM-S1	
C57	5000		144675-2	BPD-008	DD-502	TMSD5	811-005	DC-535	5HK-D5	
C58	.03	400	39001-83	P488-03		PTE483		PT413	4TM-S3	
C59	.05	600	39001-17	P688-05	DF-503	PTE685		PT615	6TM-S5	Note 1
C60	.03	200		P488-03	DF-303	PTE483		PT413	4TM-S3	Note 3
C61	5000		144675-3	BPD-005	DD-502	TMSD5	811-005	DC-535	5HK-D5	Note 1
C62	33		137727-126	S133N060						
C63	.01	400	39477-7	P488-01	DS-103	PTE451	GP2-333-103	PT411	4TM-S1	
C64	.002	200	39001-19	P288-1	DF-104	PT291		PT401	2TM-P1	
C65	.05	400	39001-17	P488-05	DF-503	PTE485		PT415	4TM-S5	
C66	.0047	400	39477-5	P488-0047	DS-472	PTE3D47	GP2-333-472	PT3247	5TM-D47	
C67	.0047	400	39477-5	P488-0047	DS-472	PTE5D47	GP2-333-472	PT5247	5TM-D47	
C68	.01	400	39478-7	P488-01	DS-103	PTE451	GP2-333-103	PT411	4TM-S1	
C69	5000		144675-3	BPD-005	DD-502	TMSD5	811-005	DC-535	5HK-D5	
C70	.005	600	39001-78	P688-006		PTE6D6		PT626	6TM-D6	
C71	.0005	600	39001-5	P685-0005		PJ6T5			6TM-T5	
C72	.047	400	39477-11	P488-047		PTE4S47		PT417	4TM-S47	
C73	.047	600	39477-11	P488-047		PTE6S47		PT617	6TM-S47	
C74	.1	600	39001-19	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C75	5000		144675-2	BPD-005	DD-502	TMSD5	811-005	DC-535	5HK-D5	
C76	.01	600	39001-13	P688-01	DS-103	PTE681	GP2-333-103	PT611	6TM-S1	
C77	1000		137727-122	S11000	D6-102	TMSD1	GP2L-102	UC-521	5HK-D1	
C78	1000		137727-122	S11000	D6-102	TMSD1	GP2L-102	UC-521	5HK-D1	
C79	.0033	1000	39478-114	P1068-0033		PTE1S33		PT1533	MB-D33	
C80	.006	600	146434-16	P688-006		PTE6D6		PT626	6TM-D6	
C81	.003	600	39001-76	P688-003	D6-302	PTE6D3	GP2-333-302	PT623	6TM-D3	
C82	.05	600	39001-16	P688-05		PTE6S5		PT615	6TM-S15	
C83	.03	400	39001-82	P488-03		PTE483		PT413	4TM-S3	
C84	75		137727-124							
C85	3900	500	137499-30	1464-004		1DHD5D4		MCB463	MS-34	
C86	560	500	137499-34							
C87	680	500	137499-33	1479-0007		2R5T7			MS-37	
C88	75		137727-124							
C89	5000		144675-2	BPD-005	DD-502	TMSD5	811-005	DC-535	5HK-D5	
C90	.1	400	39001-19	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C91	5000		144675-3	BPD-005	DD-502	TMSD5	811-005	DC-535	5HK-D5	
C92	120	5000	156569-1							
C93	500	20000	151109-1	HV20C	TV3-502	MMC-307T	413-501	HV20035A	20DK-T5	Note 3
C94	130	5000							30GA-T15	
C95	.01	400	39001-13	P488-01	D6-103	PTE451	GP2-333-103	PT411	4TM-S1	Note 4

Note 1. Not used in all models.
Note 2. Sonne Models use .005MFD in this application (part #39001-14).
Note 3. Use in Ch. 416 and 416-1 only.
Note 4. Used in Ch. 412 (Code A and B), 412-1 (Code A)and 416 (Code A)

CONTROLS

ITEM No	RATING RESIST-ANCE	RATING WATTS	CROSLEY Part No.	IRC Part No.	CLAROSTAT Part No.	CENTRALAB Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	1000 Ω	½	C-15831	* QJ-530	RTV-446		UF15R	Contrast - Panel
B	1Meg	½	Not Req.				UR16A) †	Volume - Rear
C	Switch		Not Req.				UB-26)	Attach to R1B
R2A	250KΩ	½	B-155389	QJ3-130	AG-64-Z	AB-91	U-44	Tone
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R2A
R3	5Meg	½	B-155352	QJ1-141			U-67	Brightness
R4	1Meg with 350K stop	½	B-155810	QJ-136			U-54	Vert. Hold Note 1
R5A	10Meg	½	B-156332	QJ1-143		AB-98	U-82	Noise Gate
B	Shaft		Not Req.	Not Req.		AK-4	Not Req.	Attach to R5A
R6A	5Meg with 1 Meg stop	½	B-154086	QJ1-141	AG-85-8	AB-87	SU-67	Height Note 2
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	750Ω	½	B-155819	QJ1-105	AG-8-8		U-3	Vert. Linearity
B	Shaft		Not Req.	Not Req.	RS-2		Not Req.	Attach to R7A
R8	1000Ω	1	156447		39-1000			Vert. Linearity Wire wound
R9A	5Meg	½	B-156334	QJ1-141	AG-85-8	AB-87	U-67	Detector level
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R9A
R10A	170K Ω	½	B15551	QJ1-119	AG-46	U-43	Horiz. Hold	
B	Shaft		Not Req.	Not Req.	AK-4	Not Req.	Attach to R10A	
R11	75Ω	1	B-155844		39-75			Horiz. centering Wire wound

* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS B17-108 & PS-202 (Panel)
B13-127 & RS-222 (Rear) & SWITCH 76-1.

Note 1. Connect a 330KΩ resistor in series with the left hand terminal of the control and the lead connecting to the same terminal of the original control (Control viewed from shaft end, terminals down).
Note 2. Connect a 1 Meg resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).
† Universal replacement (Mallory exact duplicate Part No. UE58S).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	CROSLEY Part No.	IRC Part No.	NOTES
R12	15KΩ	½	156906-48	BTS-15K	
R13	47KΩ	½	39374-45	BTS-47K	
R14	220KΩ	½	39374-53	BTS-220K	
R15	330KΩ	½	39374-55	BTS-330K	
R16	1500Ω	½	39374-27	BTS-1500	
R17	10KΩ	½	156906-47	BTS-10K	
R18	220KΩ	½	39374-53	BTS-220K	
R19	10KΩ	½	39374-37	BTS-10K	
R20	15KΩ	½	39374-39	BTS-15K	
R21	15KΩ	½	39374-39	BTS-15K	
R22	100Ω	½	39374-13	BTS-100	
R23	2200Ω	½	39374-29	BTS-2200	
R24	8200Ω	½	39374-36	BTS-8200	
R25	47Ω	½	39374-9	BTS-47	
R26	10KΩ 5%	½	39375-72	BTS-10K 5%	
R27	1000Ω	½	39374-25	BTS-1000	
R28	220Ω	½	39374-17	BTS-220	
R29	1000Ω	½	39374-25	BTS-1000	
R30	68Ω	½	39374-11	BTS-68	
R31	1000Ω	½	39374-25	BTS-1000	
R32	12KΩ	½	39375-75	BTS-12K	
R33	150Ω	½	39374-15	BTS-150	
R34	150Ω	½	39374-15	BTS-150	
R35	1000Ω	½	39374-25	BTS-1000	
R36	1Meg	½	39374-61	BTS-1Meg	
R37	33KΩ	1	39374-131	BTA-33K	
R38	6800Ω	2	39375-365	BTB-6800	
R39	8200Ω	½	39374-36	BTS-8200	
R40	8200Ω	½	39374-36	BTS-8200	
R41	100KΩ	½	39374-49	BTS-100K	
R42	820KΩ	½	39374-60	BTS-820K	
R43	47KΩ	½	39374-33	BTS-47K	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	CROSLEY Part No.	IRC Part No.	NOTES
R44	5600Ω	½	39375-67	BTS-5600	
R45	22KΩ	½	39374-41	BTS-22K	
R46	1Meg	½	39374-61	BTS-1Meg	
R47	1000Ω	½	39374-25	BTS-1000	
R48	82KΩ	½	39374-48	BTS-82K	
R49	82KΩ	½	39374-48	BTS-82K	
R50	390KΩ	½	39374-52	BTS-390K	
R51	220KΩ	½	39374-53	BTS-220K	
R52	4.7Meg	½	39374-77	BTS-4.7Meg	Note 1
R53	150Ω	½	39374-15	BTS-150	
R54	2200Ω	½	39374-29	BTS-2200	
R55	270Ω	½	39375-16	BTS-270	
R56	33KΩ	½	39374-43	BTS-33K	
R57	10KΩ	½	39375-73	BTS-10K	
R58	10KΩ 5%	½	39375-73	BTS-10K 5%	
R59	1500Ω	½	39374-27	BTS-1500	
R60	33KΩ	½	39374-43	BTS-33K	
R61	470KΩ	½	39374-57	BTS-470K	Note 1
R62	390KΩ	½	39374-56	BTS-390K	Note 1
R63	390KΩ	½	39374-56	BTS-390K	
R64	1.5Meg	½	39374-67	BTS-1.5Meg	
R65	120KΩ	½	39374-50	BTS-120K	
R66	390KΩ	½	39374-56	BTS-390K	
R67	100KΩ	½	39374-49	BTS-100K	
R68	1.2Meg	½	39374-63	BTS-1.2Meg	
R69	2700Ω	½	39374-30	BTS-2700	
R70	3300Ω	½	39374-31	BTS-3300	
R71	3300Ω	½	39374-31	BTS-3300	
R72	22KΩ	½	39374-41	BTS-22K	
R73	10KΩ	½	39374-37	BTS-10K	
R74	6800Ω	½	39374-35	BTS-6800	
R75	2.2Meg	½	39374-69	BTS-2.2Meg	
R76	560Ω	½	39374-23	BTS-560	
R77	2200Ω	1	39374-117	BTA-2200	
R78	150KΩ	1	39374-51	BTA-150K	
R79	680Ω	½	39374-33	BTS-680	
R80	680Ω	½	39374-33	BTS-680	
R81	390KΩ	½	39374-56	BTS-390K	
R82	820KΩ	½	39374-60	BTS-820K	
R83	100KΩ	½	39374-49	BTS-100K	
R84	100KΩ	½	39374-49	BTS-100K	
R85	22KΩ	½	39374-41	BTS-22K	
R86	4.7Meg	½	39374-77	BTS-4.7Meg	Note 5
R87	4.7Meg	½	39374-77	BTS-4.7Meg	
R88	68KΩ	1	39374-135	BTA-68K	
R89	68KΩ	1	39374-135	BTA-68K	
R90	1200Ω	½	39374-26	BTS-1200	
R91	5600Ω	½	39374-34	BTS-5600	
R92	27KΩ	½	39374-42	BTS-27K	
R93	4700Ω	½	39374-33	BTS-4700	
R94	56KΩ	½	39374-46	BTS-56K	
R95	220KΩ	½	39374-53	BTS-220K	
R96	15KΩ	½	39374-39	BTS-15K	
R97	68KΩ	½	39374-47	BTS-68K	
R98	1.5Ω	½	39374-13	BTS-100	
R99	1Meg	½	39374-61	BTS-1Meg	
R100	15KΩ	2	39374-215	BTB-15K	
R101	15KΩ	2	39374-215	BTB-15K	
R102	1800 Ω	½	39374-202	BTS-1800	Note 3
R103	10KΩ	½	39374-37	BTS-10K	
R104	1000Ω	½	39374-25	BTS-1000	
R105	470KΩ	½	39374-57	BTS-470K	
R106	7.5Ω	7.5	156540		
R107	1.5Ω	½	39303-9		Note 4
R108	1.5Ω	½	39303-9		Note 3
R109	3300Ω	½			Note 4
R110	470KΩ	½	39374-57	BTS-470K	
R111	470KΩ	½	39374-57	BTS-470K	

Note 1. Not used in all models.
Note 2. Used in chassis No. 412A, 413-1 only.
Note 3. Used in chassis No. 412-1 & 416-1 only.
Note 4. Used in chassis No. 412 & 416 only.
Note 5. Some models may use a 4.7MΩ resistor in this application.

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	CROSLEY Part No.	Stancor Part No.	Merit Part No.	Triad Part No.	RCA TYPE No.	Halldorson Part No.	Thordarson Part No.
T1	117VAC	12.6VCT ② 7.7A	② 5.7A	155532-A		P-2963	F-36A①②			

① Series parallel connect windings.
② Drill new mounting holes.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	CROSLEY Part No.	Stancor Part No.	Merit Part No.	Triad Part No.	RCA TYPE No.	Halldorson Part No.
T2	Vert. Osc. Trans.	155355-1	A-8125	A-3003	A-97X		B6702
T3	Horiz. Output Trans.	155445-2 ①					
T4	Vert. Output Trans.	155988					
		155966-1 ②					
		155966-2 ②					
T5A	Yoke (90 degrees)-Horiz. (L. 5MH)	156469-1		MDF-90	Y-50	219D1④	
B	Yoke-Vert. (42MH)	156839-1 ③					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	CROSLEY Part No.	Stancor Part No.	Merit Part No.	Triad Part No.	Halldorson Part No.	Thordarson Part No.	NOTES
T6	2.2KΩ	3.2Ω	154102-3	A-3825 ①	A-2905 ①	S-4X ①	Z1103	T2-24S50	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	CROSLEY Part No.	VIKING Part No.	QUAM Part No.	NOTES
SP1	12"	PM	3.2Ω	155624-1	12J11	12A31	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	CROSLEY Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	NOTES
L1A	Ant. Coil	0ΩCT	0Ω	156907-2				Channel 3
B	Ant. Coil	0ΩCT	0Ω	156907-3				Channel 4
C	Ant. Coil	0ΩCT	0Ω	156907-4				Channel 5
D	Ant. Coil	0ΩCT	0Ω	156907-5				Channel 6
E	Ant. Coil	0ΩCT	0Ω	156907-6				Channel 7
F	Ant. Coil	0ΩCT	0Ω	156907-7				Channel 8
G	Ant. Coil	0ΩCT	0Ω	156907-8				Channel 9
H	Ant. Coil	0ΩCT	0Ω	156907-9				Channel 10
I	Ant. Coil	0ΩCT	0Ω	156907-10				Channel 11
J	Ant. Coil	0ΩCT	0Ω	156907-11				Channel 12
K	Ant. Coil	0ΩCT	0Ω	156907-12				Channel 13
L	Ant. Coil	0ΩCT	0Ω	156907-13				
L2	Fil. Choke	0Ω		156906-50				
L3	Neutr. Coil	0Ω		156906-49				

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	CROSLEY Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	NOTES
L4A	RF, Mixer grid & osc. coil	0Ω		156908-2				Channel 2
B	RF, Mixer grid & osc. coil	0Ω		156908-3				Channel 3
C	RF, Mixer grid & osc. coil	0Ω		156908-4				Channel 4
D2	RF, Mixer grid & osc. coil	0Ω		156908-5				Channel 5
E	RF Mixer grid & osc. coil	0Ω		156908-6				Channel 6
F	RF Mixer grid & osc coil	0Ω		156908-7				Channel 7
G	RF, Mixer grid & osc. coil	0Ω		156908-8				Channel 8
H	RF, Mixer grid & osc. coil	0Ω		156908-9				Channel 9
I	RF, Mixer grid & osc. coil	0Ω		156908-10				Channel 10
J	RF, Mixer grid & osc. coil	0Ω		156908-11				Channel 11
K	RF, Mixer grid & osc. coil	0Ω		156908-12				Channel 12
L	RF, Mixer grid & osc. coil	0Ω		156908-13				Channel 13
L5	Fil. Choke	0Ω		156908-51				
L6	RF Choke	0Ω		156906-52				
L7	Conv. Plate	.5Ω		156905-53				
L8	1st Video IF	.2Ω		155304				6345
L9	RF Choke	5Ω		156381		19-3075 ▲	TV-186 ▲	6175 ▲ Includes trap 70 Microhenries; wound on 3.9KΩ resistor
L10	2nd Video IF	.3Ω		155318		17-1062	TV-116	6350
L11	3rd Video IF	.4Ω		155349				Includes trap
L12	RF Choke	4.2Ω		156362				4606 5 Microhenries
L13	4th Video IF	.6Ω		155594-1				Includes 1N64 crystal detector
L14	Series Peak. Coil	3.2Ω		154376				6634 15.5Microhenries
L15	Series Peak. Coil	6Ω		156714		19-3093	TV-161	6177 90 Microhenries
L16	Shunt Peak. Coil	13Ω		154184		19-3300	TV-168	6155 335 Microhenries
L17	Series Peak. Coil	15Ω		154194		19-4412	TV-168 *	6648 * 414 Microhenries; wound on 8.2KΩ resistor
L18	4.5MC Trap	2.9Ω		155446		20-1004	TV-151	1470
L19	Shunt Peak. Coil	5.5Ω		154206		19-4121	TV-181 ▲	4642 ▲ 106 Microhenries; wound on 6.8KΩ resistor
L20	Shunt Peak. Coil	12Ω		156819		19-3250	TV-185	6181 240 Microhenries
L21	Series Peak. Coil	7.5Ω		156818		19-4121	TV-182 ♦	6153 * 117 Microhenries; wound on 8.2KΩ resistor
L22	Sound IF	1Ω		155442		17-3400	TV-151	1469
L23	Ratio Det.	4Ω	.7DCT	154108-1		17-1033	TV-110	1468 Tertiary winding-.5Ω
L24	Horiz. Osc.	90Ω		154220		19-1576	TV-163	6310
L25	RF Choke	2Ω		156575				6624 † 18 Microhenries; wound on 1.8KΩ resistor
L26	Anti-ringing coil	23Ω		155944				6306 ■ 10 Microhenries; wound on .1 MFD capacitor
L27	Fil. Choke	0Ω				19-3001	TV-189	6175 .5 Microhenry; Not used in all models

* Parallel with 2.2KΩ resistor.
▲ Parallel wit h 6.8KΩ resistor.
♦ Parallel with 3.9KΩ resistor.
† Parallel with 180Ω resistor.
■ Parallel with .1MFD capacitor.
♦ Parallel with 13KΩ resistor.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 (⁴/₀)	CROSLEY Part No.	Stancor Part No.	Merit Part No.	Triad Part No.	Halldorson Part No.	Thordarson Part No.
L28	.240A	28Ω	1.2HY	156905-1	C-3328 ①		C-33X	C5037 ①	T-28C44

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No	RATING CURRENT	CROSLEY Part No.	SELETRON Part No.	FEDERAL Part No.	MALLORY Part No.	SARKES TARZIAN Part No.	NOTES
M1	.340A	155575-1	6Q4	118TA	8S300	350	
M2	.240A	155575-1	6Q4	118TA	8S300	350	

PARTS LIST AND DESCRIPTIONS (Continued)

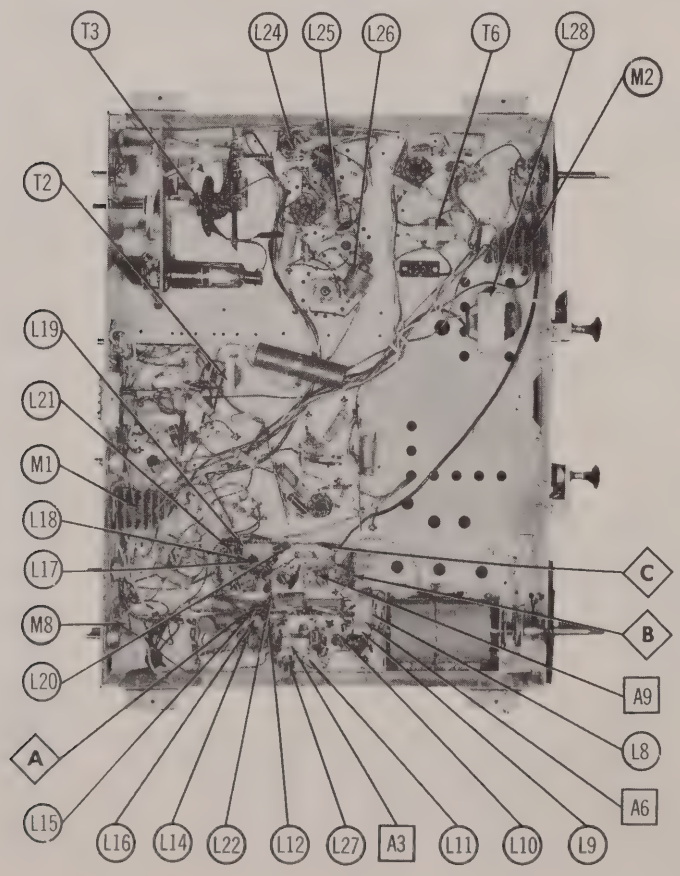
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		CROSLEY PART No.	SYLVANIA PART No.		
M3	1N72	151871	1N82 or 1N82A		UHF Mixer
M4	1N64	15411	1N132		Video Detector (part of assembly)

MISCELLANEOUS

ITEM No.	PART NAME	CROSLEY PART No.	NOTES
M5	Dial Light	138437-8	#44 Bayonet (See Note 1)
M6	Tuner	156930	UHF used on 412-1 & 416-1 chassis only
M7	Tuner	156189	VHF
M8	Switch	156329-1	Local-Distance (Rotary-wafer)
M9	Switch	156170-1	UHF-VHF changeover
M10	Focus Magnet	155788-2	Includes centering device
M11	Ion Trap	154109-4	
	Cabinet	156117	Models F-24CDMH & CDMU
	Cabinet	156129	Models F-24CDBH & CDBU
	Cabinet	156414-1	Models F-27COMH & COMU
	Cabinet	156414-2	Models F-27COBH & COBU
	Back Cover	156542	Includes power cable assy. (F-24CDMH, F-24CDBH)
	Back Cover	156588	Includes power cable assy. (F-24CDMU, F-24CDBU)
	Back Cover	156574	Includes power cable assy. (F-27COMH, F-27COBH)
	Back Cover	156594	Includes power cable assy. (F27COMU, F-27COBU)
	Button	156109-1	UHF indicator channel 6 } F-24CDMU, F27COMU
	Button	156109-2	UHF indicator channel 5 }
	Button	156109-3	UHF indicator channel 6 } F-24CDBU, F-27COBU
	Button	156109-4	UHF indicator channel 5 }
	Knob	154265	Local-distance switch
	Knob	154270	Horiz. & vert. hold controls
	Knob	155513-1	Tone & brightness controls - mahogany cabinet
	Knob	155513-2	Tone & brightness controls - blonde cabinet
	Knob	156011-1	Fine tuning (2) VHF & UHF - mahogany
	Knob	156011-2	Fine tuning (2) VHF & UHF - blonde
	Knob	156231-1	VHF channel selector for Mahogany cabinet
	Knob	156231-2	VHF channel selector for blonde cabinet
	Knob	156232-1	UHF channel selector for mahogany cabinet
	Knob	156232-1	UHF channel selector for blonde cabinet
	Knob	156233-1	Off/on/volume control for mahogany cabinet
	Knob	156233-2	Off/on/volume control for blonde cabinet
	Knob	156252-1	Contrast control for mahogany cabinet
	Knob	156252-2	Contrast control for blonde cabinet
	Safety glass	155350-9	24" Models
	Safety glass	155465-1	27" Models

Note 1. On VHF models one dial lamp is used; on VHF-UHF models use three lamps, two for UHF, one for VHF



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
[illegible]NKENSHIP
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1. If filaments light, check R106, M1, M2 and other components that form the B+ network.

SMALL AND/OR DIM PIX

Measure B+.

If Satisfactory	If Unsatisfactory
See Horizontal, Insufficient Sweep.	Check M1, M2 and other associated components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V17, V18, V19, V20 and V21. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check R103, C93, T3, T5A, C90, R100, R101 and other associated circuit components.	Check C84, C86, C89, R97, R99 and other associated circuit components.

INSUFFICIENT HIGH VOLTAGE

Check B+.

If Satisfactory	If Unsatisfactory
See "Loss of High Voltage".	Check M1, M2 and other associated components.

BLOOMING

Check by substitution V17, V18, V19, V20 and V21. Check R103, C93, T3, T5A, C90, R100, R101, picture tube and other associated components for failure or change of value.

GENERAL

RASTER SOUND NO PIX

Follow procedure outlined under "Loss of Video".

RASTER PIX NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO PIX NO SOUND

Check V1, V2, V3, V4, V5, V6 and V7. Check associated components. Check video detector assembly.

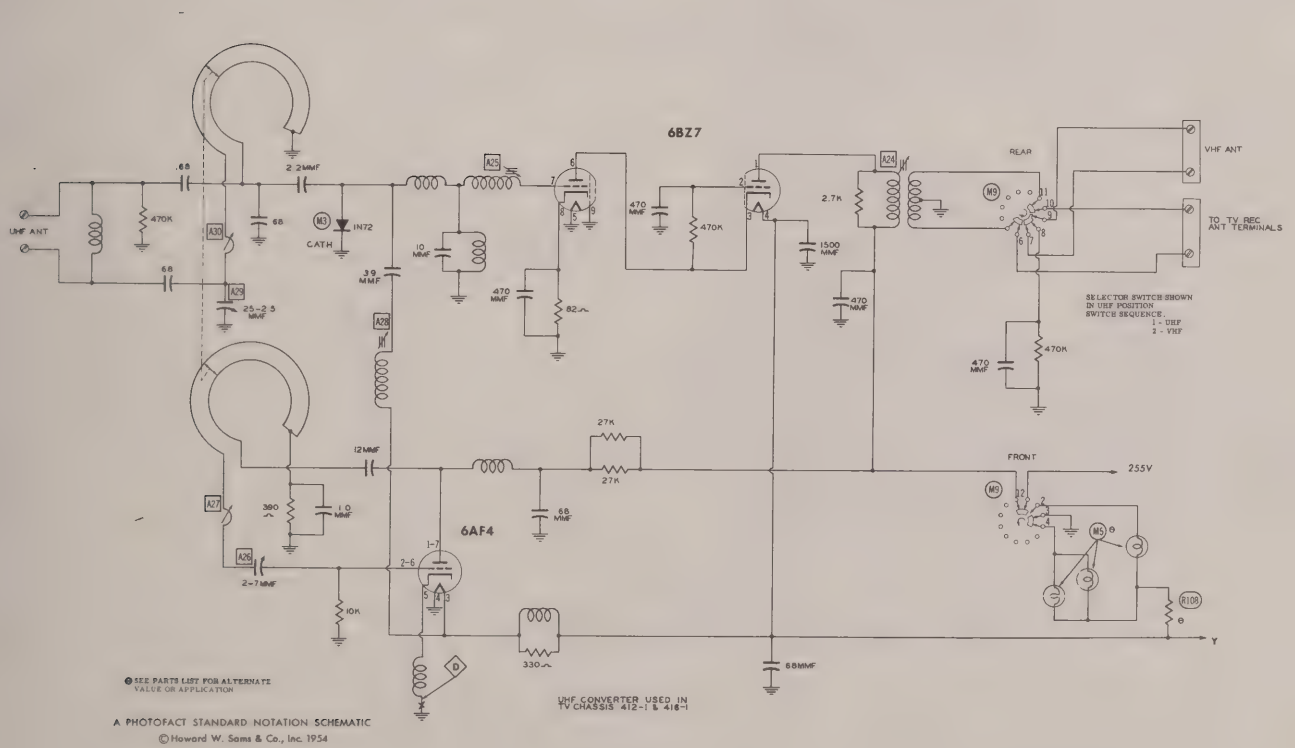
NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

INTERMITTENT STREAKS

Check video signal for interference pulses. Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



UHF TUNER SCHEMATIC

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

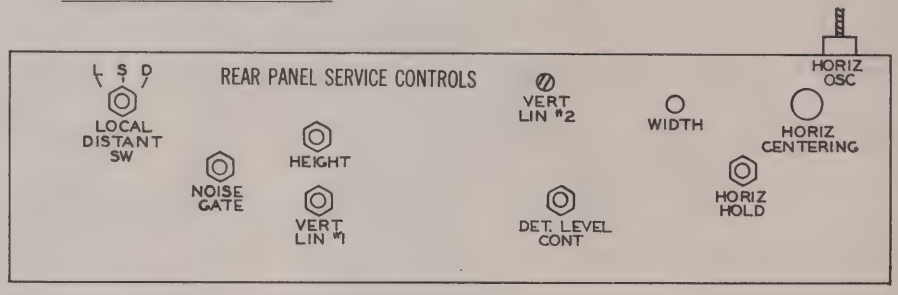
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety Glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horiz. Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the Horiz. Hold Control at the center of its range and adjust the Horiz. Osc. Slug (L24)until,picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary(L 23) located on top of chassis. (See tube placement chart).

FUSES

One fuseable resistor is used for L. V. Power Supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the P. M. Focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

Remove 7 push on type control knobs from front panel.

Disconnect built-in antenna.

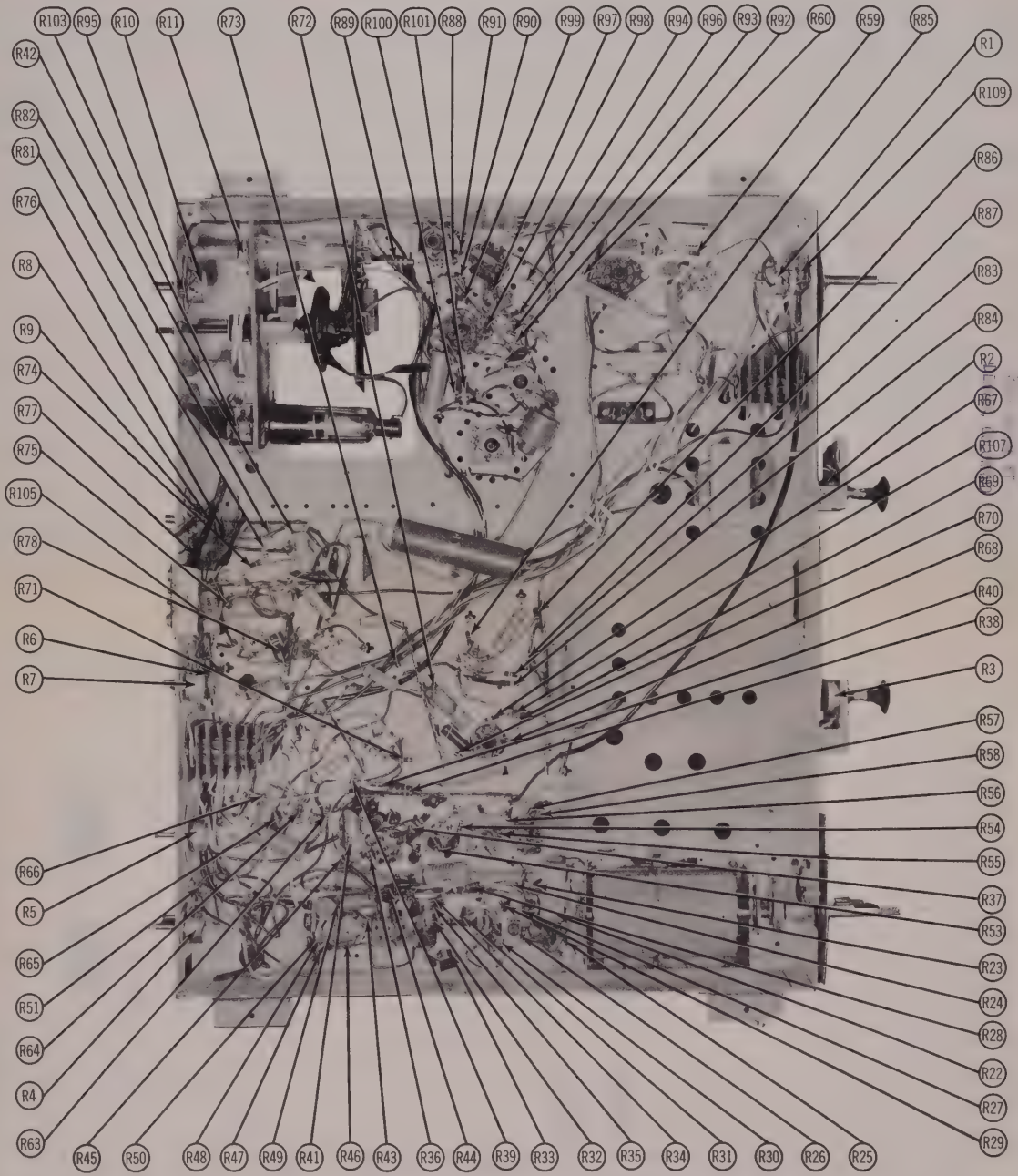
Remove 7 wood and 1 metal screws,Remove rear cover.

Remove 1 wood screw. Disconnect transmission line.

Disconnect speaker plug.

Remove 5 chassis bolts. Remove chassis.

Remove 4 speaker nuts. Remove speaker.

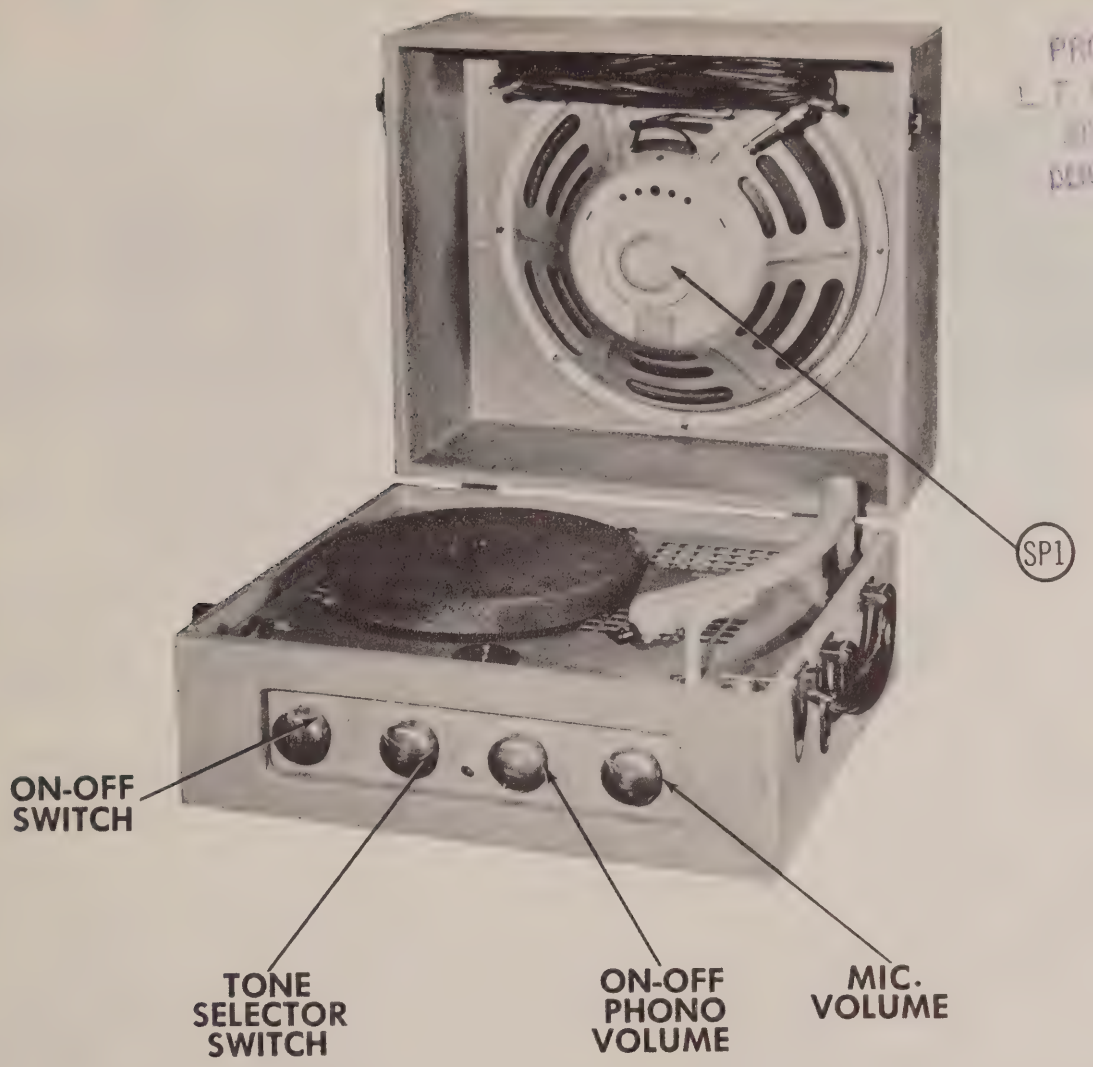


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP

PROPERTY OF
L. T. [illegible]
[illegible]
DENVER, COLORADO

DAVID BOGEN
MODEL ET16



DAVID BOGEN
MODEL ET16

TRADE NAME	David Bogen Model ET16
MANUFACTURER	David Bogen Co., Inc., 29 Ninth Ave., New York 14, N.Y.
TYPE SET	AC Operated 2 Channel 5 Watt Audio Amplifier With 3 Speed Manual Record Player
TUBES (Four)	Types 6AV6 Mic Pre-Amp., 6SJ7 AF Amp., 6L6GA Audio Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC RATING .56 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

DAVID BOGEN
MODEL ET16

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		David Bogen PART No.	STANDARD REPLACEMENT		
V1	Mic Pre. Amp.	6AV6	6AV6	7BT	
V2	AF Amplifier	6SJ7	6SJ7	8N	
V3	Audio Output	6L6GA	6L6GA	7S	
V4	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲5	450		AFH4-09		D008		WP433.6	R1424	
B	■5	450								
C	▲5	450								
D	5	450								
C2	10	25		PRS25/10		BR102A		TC22	TVA-1204	
C3	50	50		PRS50/50		BR505		TC39	TVA-1308	
C4	.02	600		P688-02	D6-202	PTE6S2		PT612	6TM-S2	
C5	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C6	.01	600		P688-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C7	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C8	.1	400		P488-1		PTE4P1		PT401	4TM-P1	
C9	100	500		1469-0001	D6-101	5W5T1	GP1K-101	MC235	MS-31	
C10	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C11	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C12	.1	400		489ZX-1		PTE4P1		PT401	4TM-P1	

CONTROLS

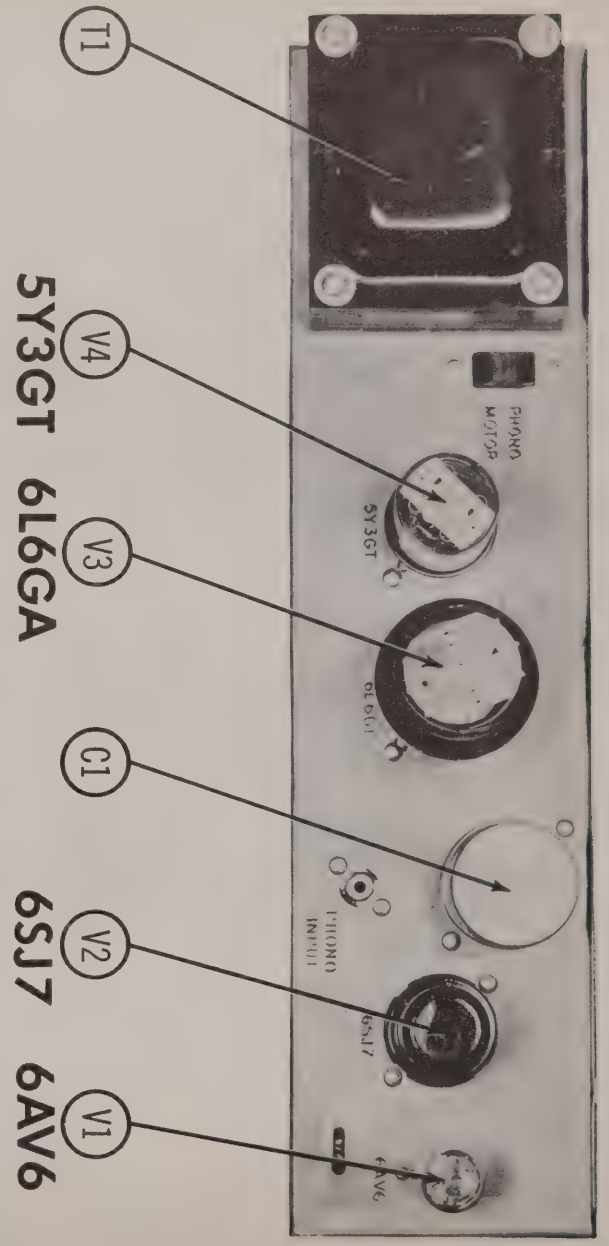
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	David Bogen PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	V-202-C	Q13-133	AG-60-Z	B-60	U-48	Mike volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	V-149-A	Q13-133	AG-60-Z	B-60-S	U-48	Phono volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R2A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R3	10 Meg	½		BTS-10Meg	
R4	220KΩ	½		BTS-220K	
R5	470KΩ	½		BTS-470K	
R6	470KΩ	½		BTS-470K	
R7	8200Ω	½		BTS-8200	
R8	8200Ω	½		BTS-8200	
R9	1000Ω	½		BTS-1000	
R10	2200Ω	½		BTS-2200	
R11	100Ω	½		BTS-100	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R12	3300Ω	½		BTS-3300	
R13	1 Meg	½		BTS-1 Meg	
R14	220KΩ	½		BTS-220K	
R15	220KΩ	½		BTS-220K	
R16	270Ω	2		BW-2-270	
R17	47KΩ	½		BTS-47K	
R18	47KΩ	2		BTB-47K	
R19	4700Ω	2		BTB-4700	
R20	500Ω	4		PW4-500	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .56A	700VCT .072 ADC	5 VAC @ 2A	6.3VCT @1.38A	T-362-1	PM-8409	P-2952	R-11B	P9311	TS-24R04

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	4.4KΩ	15Ω tap @ 8Ω @ 4Ω	T-262 ①				Z1109		① 8Ω tap not used, and 15Ω tap used in feed back network.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	David Bogen PART No.	VIKING PART No.	QUAM PART No.	
SP1	12"	PM	4Ω		12J11	12A31	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	David Bogen PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		LQD-1J * 400-D	Q Q-33			96-0	0-1 0-3	* Complete arm and cartridge assembly.

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

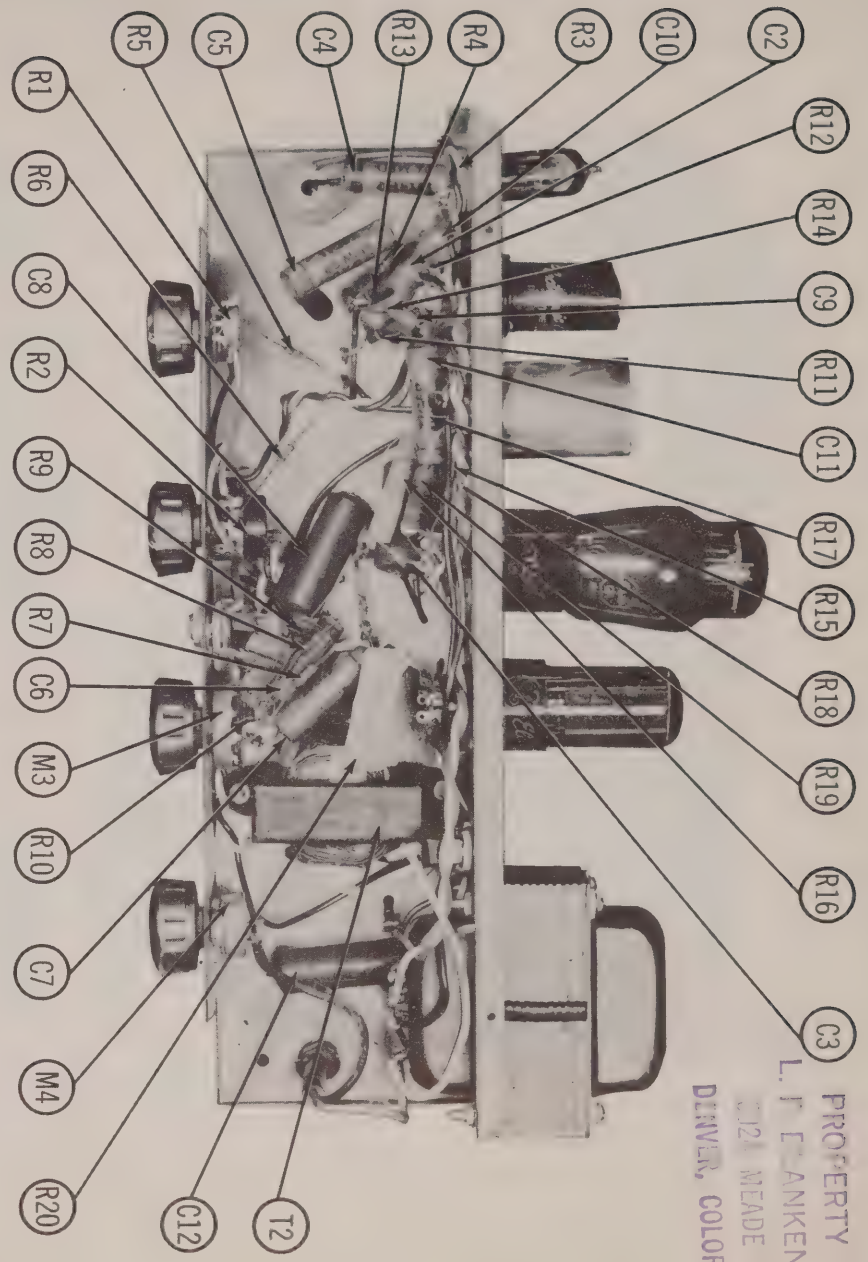
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	David Bogen PART No.	WALCO PART No.	JENSEN PART No.	
M2		W-2A or W-2S and W-2MGA or W-2MGS	A-80 or A-81 and A-80LP or A-81LP	

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M3	Switch	S-326A	Tone Selector
M4	Switch	S-336	Off/on

CHASSIS—BOTTOM VIEW

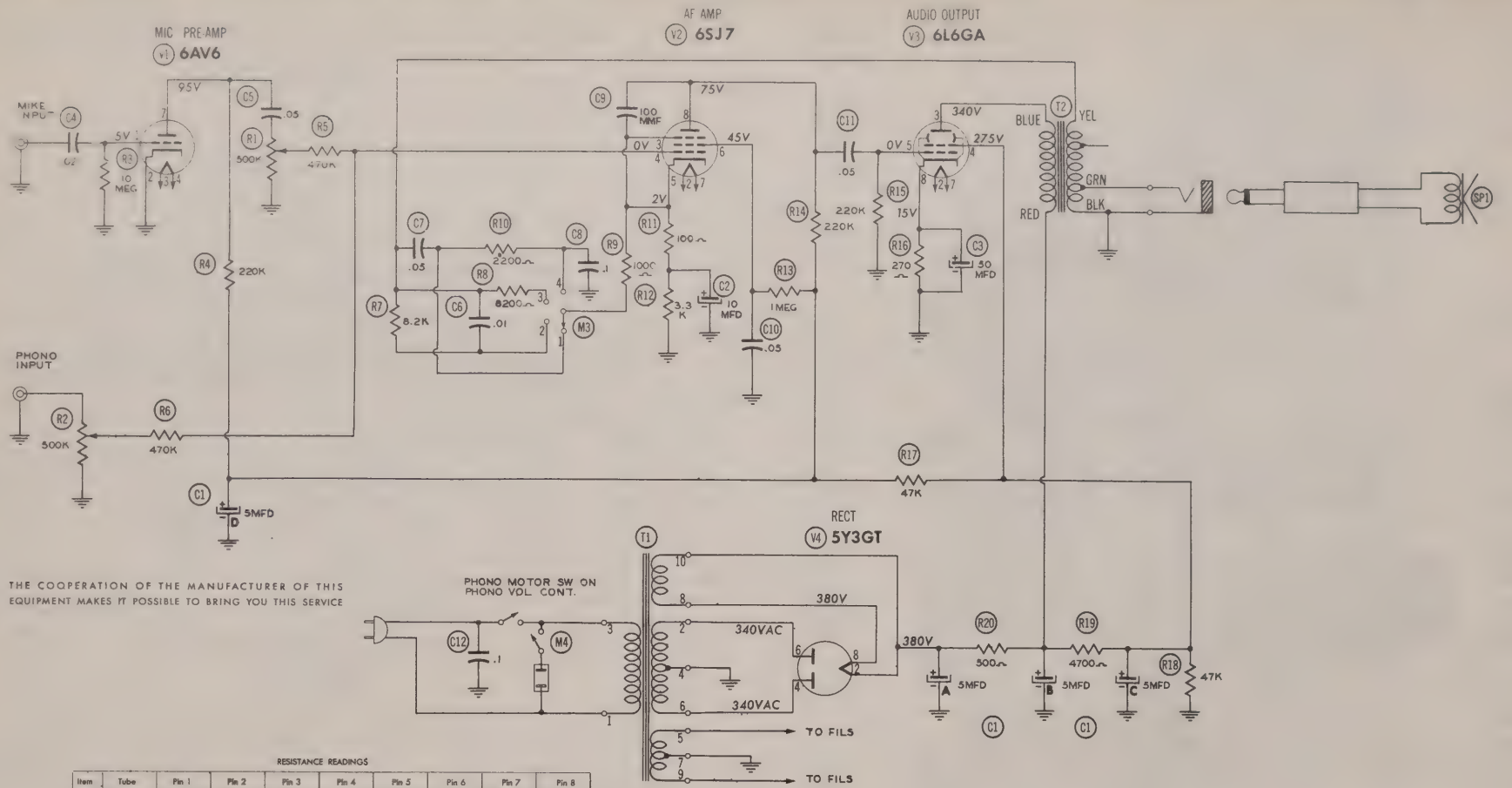


PROPERTY OF
L. F. FRANKENSHIP
1024 MEADE ST.
DENVER, COLORADO

DAVID BOGEN
MODEL ET16

SET 234
FOLDER 6

DAVID BOGEN
MODEL ET16



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6AV6	10Meg	0Ω	.1Ω	.1Ω	0Ω	0Ω	■270KΩ	
V 2	6SJ7	0Ω	.1Ω	†2.4KΩ #3.4KΩ	440KΩ	†2.4KΩ #3.4KΩ	■1Meg	.1Ω	■270KΩ
V 3	6L6GA	INF	.1Ω	■645Ω	■5.2KΩ	220KΩ	INF	.1Ω	270Ω
V 4	5Y3G	INF	50KΩ	INF	180Ω	■500Ω	165Ω	INF	50KΩ

† MEASURED IN POSITIONS 2 & 3.
# MEASURED IN POSITIONS 1 & 4.
■ MEASURED FROM PIN 2 OF V4

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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DEWALD MODEL H-528

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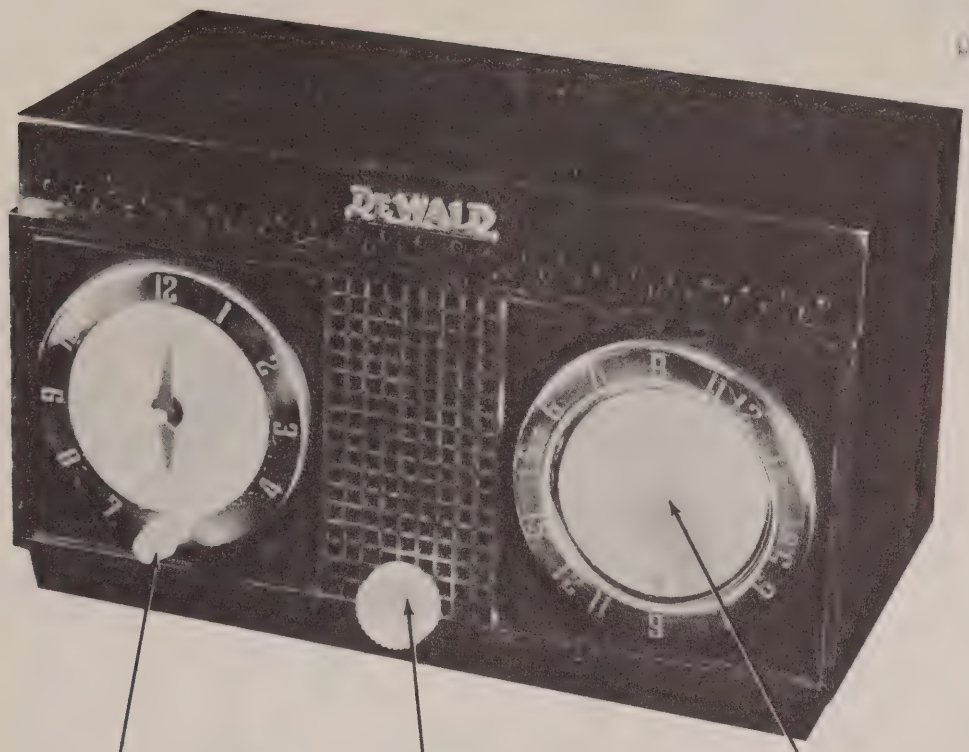
ST
DENVER, COLORADO

DEWALD
MODEL H-528



DEWALD
MODEL H-528

TRADE NAME	Dewald Model H-528
MANUFACTURER	Dewald Radio Mfg. Co., 35-15 37th. Ave., Long Island City, N.Y.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12AU6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400%Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A4	"

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PARTS LIST AND DESCRIPTIONS

DEWALD MODEL H-528

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		DEWALD PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12AU6	12AU6	7BK	
V3	Det.-AVC-AF Amp.	12AV6	12AV6	5BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	DEWALD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	30	150	2033-2	PRS150/30-		EDL3315SS		2N513	TVA-2434	
B	30	150		30						
C2	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	2.2			SI2.2NP0	TCZ-2.2	TZ05	NP0A-2R2		5TCCB-V22	
C4	120			BPD-00012	D6-121	G044	801-00012	UC-5312	5GA-T12	
C5	220			BPD-00022	D6-221	G051	801-00022	UC-5322	5GA-T22	
C6	2000			SI2000	D6-202	TP56	GP2L-202	DC-522	5HK-D2	
C7A	5000									
B	250		♦2066	♦PA-112-1	♦PC-70	♦112TM1	♦1406-01		♦104C4	
C										
C8	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C9	.05	400		489ZX-05		PJ4S5		PT415	4TM-S5	
C10	.05	400		P488-05		PJ4S5		PT415	4TM-S5	

♦ Items C7A, C7B, C7C, R8A and R8B are combined in one unit.
When replacing items separately, items C7B and C7C total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DEWALD PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	2 Meg	½	3043A-2	Q13-139	AG-66-Z	AB-76	U-55	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A

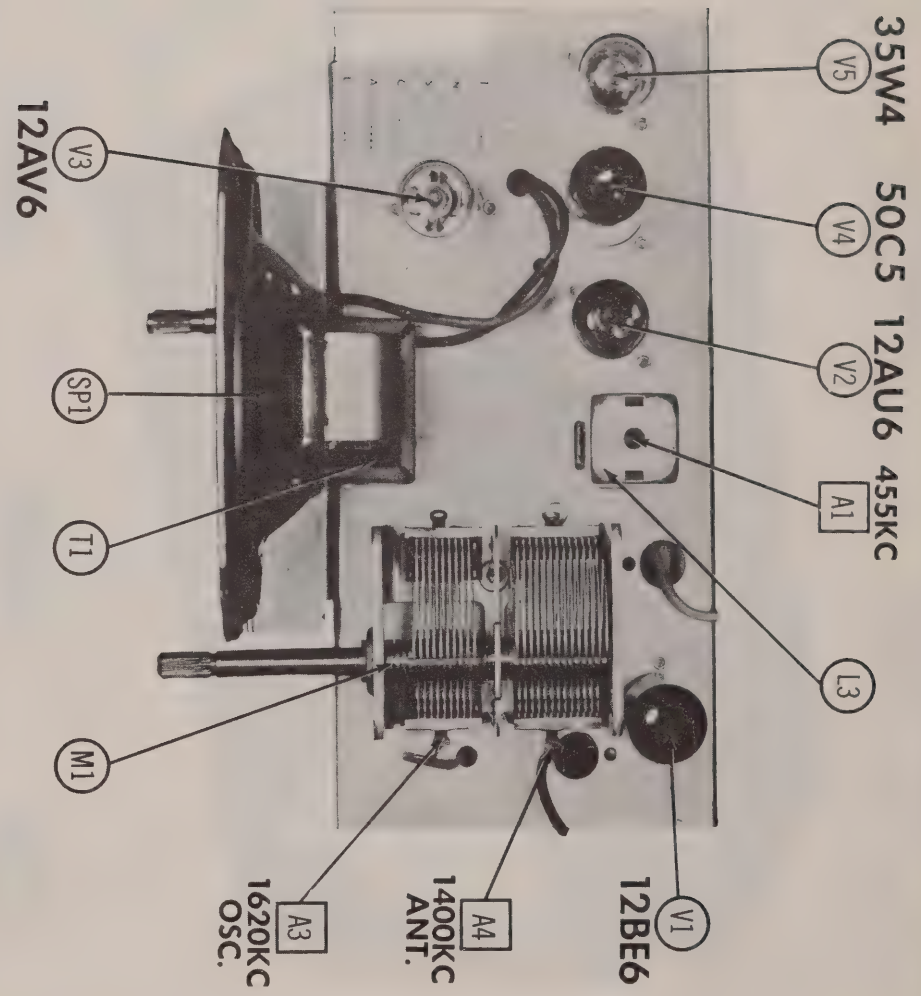
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DEWALD PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	1500Ω	½		BTS-1500	
R4	12KΩ	½		BTS-12K	
R5	100KΩ	½		BTS-100K	
R6	3.3Meg	½		BTS-3.3Meg	
R7	10Meg	½		BTS-10Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DEWALD PART No.	IRC PART No.	
R8A	500KΩ	½	♦2066		
B	500KΩ	½			
R9	150Ω	½		BTS-150	
R10	1500Ω	1		BTA-1500	
R11	15Ω	½		BTS-15	
R12	470Ω	½		BTS-470	Note

♦ Items R8A, R8B, C7A, C7B, C7C, are combined in one unit.
Note: Not used in all models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DEWALD PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.3KΩ	3.4Ω	Part of Spkr.	A-3332	A-3025		Z1101		

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	DEWALD PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.4Ω	7003C-5	ST-113 Mod. P4-X	4A07	

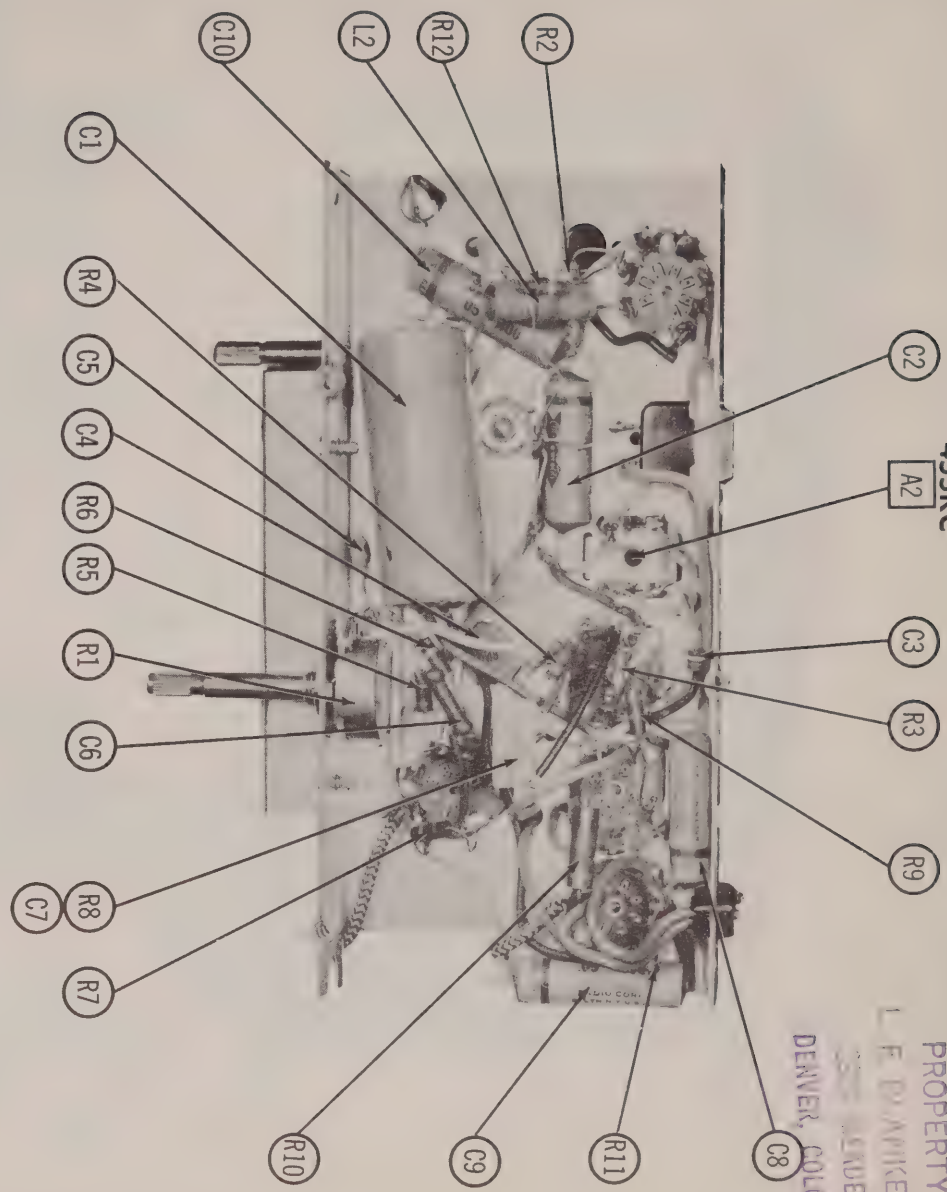
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	DEWALD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	0Ω	3.1Ω	1147-B				
L2	Osc. Coil	5.5Ω		1028-4				Tapped @ .7Ω
L3	IF Trans.	20Ω	20Ω	10916-7	16-6758	BC-353	12-C2	

MISCELLANEOUS

ITEM No.	PART NAME	DEWALD PART No.	NOTES
M1	Tuning cap	2065-6	2 section (31-442MMF, 33-195MMF)
M2	Clock	8095	
	Cabinet	4212	
	Knob	4213	(2) used

CHASSIS—BOTTOM VIEW

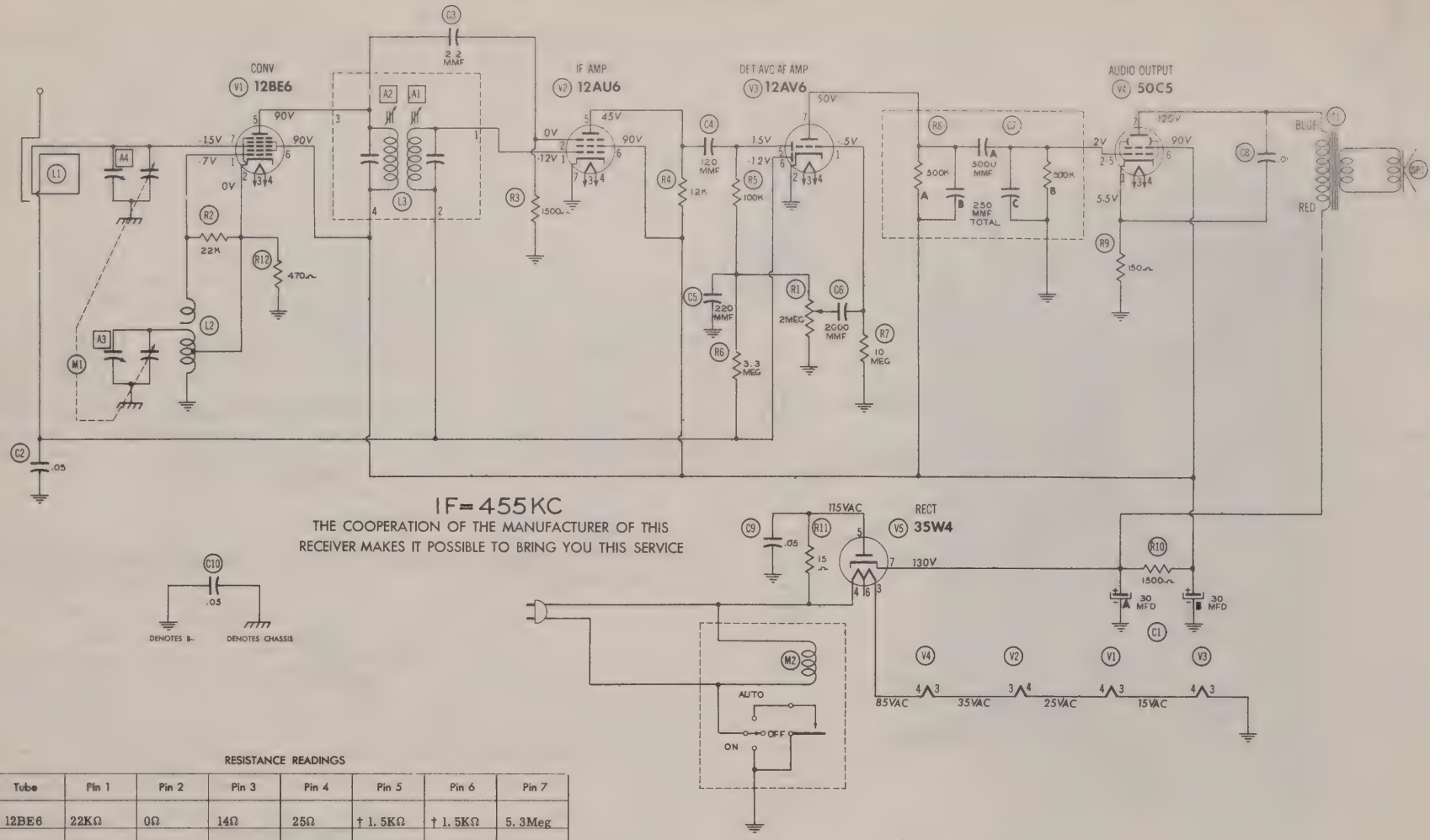


PROPERTY OF
L. F. DAMKENSHIP
DENVER, COLORADO

DEWALD
MODEL H-528

SET 234 FOLDER 7

DEWALD
MODEL H-528



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	0Ω	14Ω	25Ω	† 1.5KΩ	† 1.5KΩ	5.3Meg
V 2	12AU6	5.3Meg	1500Ω	36Ω	25Ω	† 13.5KΩ	† 1.5KΩ	0Ω
V 3	12AV6	10Meg	0Ω	0Ω	14Ω	2.1Meg	5.3Meg	† 500KΩ
V 4	50C5	150Ω	500KΩ	36Ω	90Ω	500KΩ	† 1.5KΩ	† 210Ω
V 5	35W4	0Ω	INF	90Ω	130Ω	145Ω	120Ω	300KΩ

† MEASURED FROM PIN 7 OF V5.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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EMERSON
MODEL 747 (Ch. 120178)

EMERSON
MODEL 747 (Ch. 120178)

TRADE NAME	Emerson Model 747 (Ch. 120178)
MANUFACTURER	Emerson Radio & Phono Corp., 111 Eighth Ave., New York, N.Y.
TYPE SET	Battery Operated Portable Superheterodyne Receiver
TUBES (Four)	Types 1V6 Conv., 1AH4 IF Amp., 1AJ5 Det.-AVC-AF Amp., 1AG4 Audio Output
POWER SUPPLY	1½ Volts "A" Supply & 45 Volt "B" Supply
RATING	160MA @ 1.5 Volts DC & 4MA @ 45 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 3 (grid) of 1V6 (V1). Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum deflection. Replace chassis and batteries in cabinet for remainder of alignment. Remove access plate in cabinet opposite tuning gang trimmers.
2.		Loop	1640KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"
4.		"	600KC	Tune to 600KC signal	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 2, 3 and 4 until no further improvement is obtained.

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PARTS LIST AND DESCRIPTIONS

EMERSON
MODEL 747 (Ch. 120178)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		EMERSON PART No.	STANDARD REPLACEMENT		
V1	Converter	1V6	1V6		
V2	IF Amp.	1AH4	1AH4		
V3	Det-AVC-AF Amp.	1AJ5	1AJ5		
V4	Audio Output	1AG4	1AG4		

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	8	50	925238	SRE50/10					2TM-S2	
C2	.022	200	920577	P288-02	DF-203	PJ2S2			2TM-S2	
C3	5		928088	SI5	D6-050		GP1K-050	NT-555	5GA-V5	
C4	2000		928094	BPD-002	DD-202	TM5D2	812-002	DC-522	5HK-D2	
C5	5		928088	SI5	D6-050		GP1K-050	NT-555	5GA-V5	
C6A	200									
B	1000									
C	100		928034	PA-196					34C8	
D	10000									
E	1000									
C7	2000		928094	BPD-002	DD-202	TM5D2	812-002	DC-522	5HK-D2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	1 Meg	1	390223					Volume - wire wound

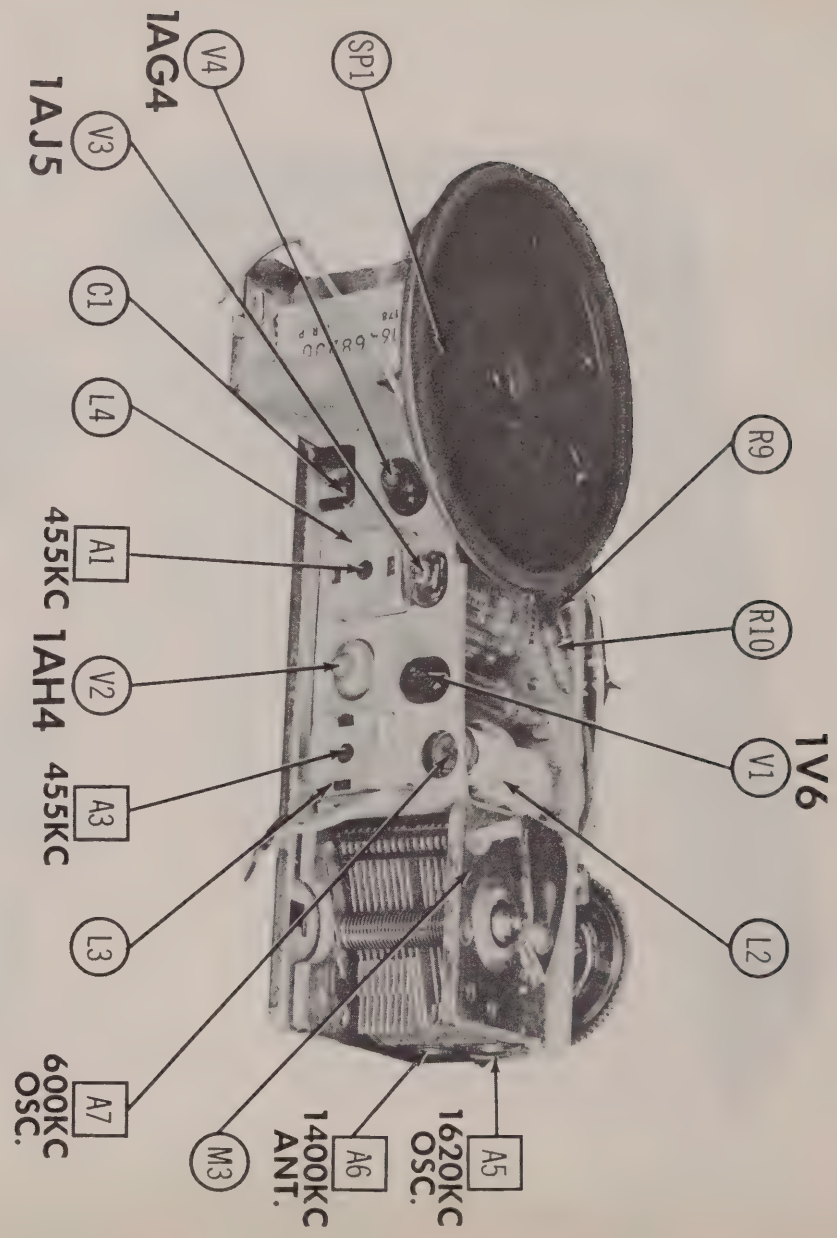
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON PART No.	IRC PART No.	
R2	4.7Meg	1/2	351372	BTS-4.7Meg	
R3	1 Meg	1/2	341212	BTS-1 Meg	
R4	10 Meg	1/2	351452	BTS-10Meg	
R5	100KΩ	1/2	350972	BTS-100K	
R6	5.6Meg	1/2	341392	BTS-5.6Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON PART No.	IRC PART No.	
R7	3.9Meg	1/2		BTS-3.9Meg	Note
R8	1 Meg	1/2	341212	BTS-1Meg	
R9	10 Meg	1/2	351452	BTS-10Meg	
R10	1500Ω	1/2	340532	BTS-1500	

Note: Some models may use a 3.8Meg resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	EMERSON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	3.74KΩ	20Ω	734083						

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	EMERSON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	2 3/4"	PM	20Ω	180105			

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	EMERSON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.7Ω		700085				
L2	Osc. Coil	1.4Ω	8.5Ω	716079				
L3	Input IF	18Ω	18Ω	720174				
L4	Output IF	18Ω	18Ω	720174				

BATTERIES

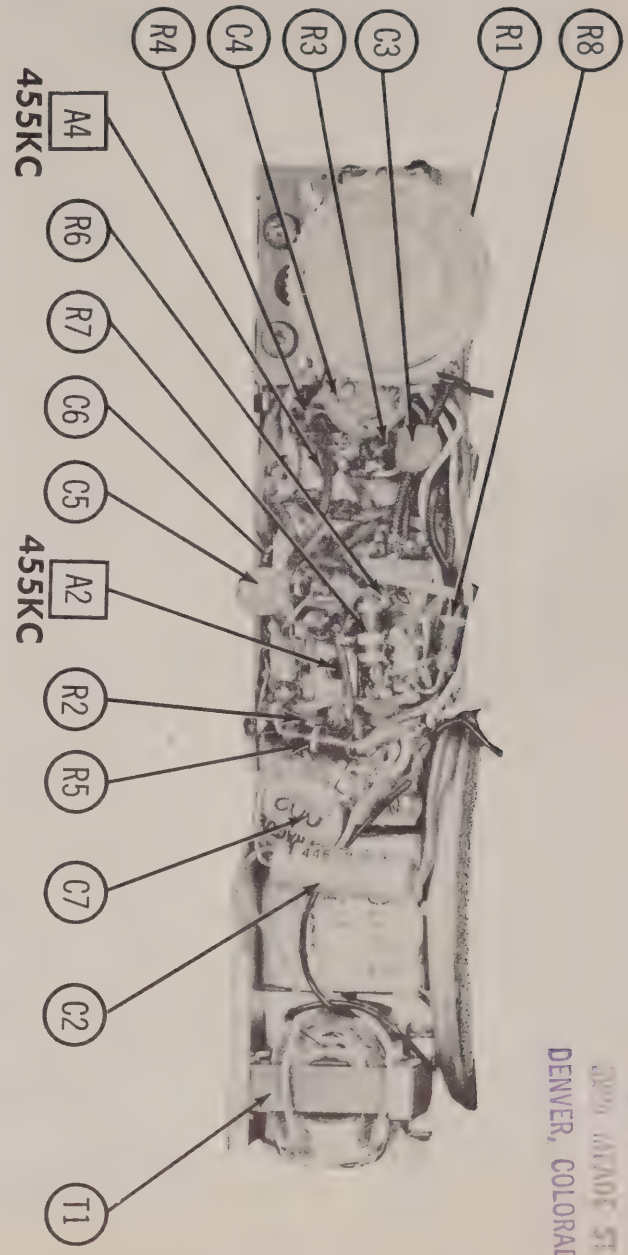
ITEM No.	VOLTAGE	EMERSON PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	1.5V "A"	818109	635			1	U30		
M2	45V "B"	818110		415					

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	Tuning Cap.	900101	2 Section
	Cabinet Shell	140511	Specify color
	Cabinet Front	140512	
	Antenna Shell	460428	
	"A" Battery Door	960753	
	"B" Battery Door	460406	
	Access Door	460418	
	Handle	460486	
	Knob	460429	Tuning
	Knob	960754	Volume - includes switch actuator

SET 234 FOLDER 8

CHASSIS—BOTTOM VIEW



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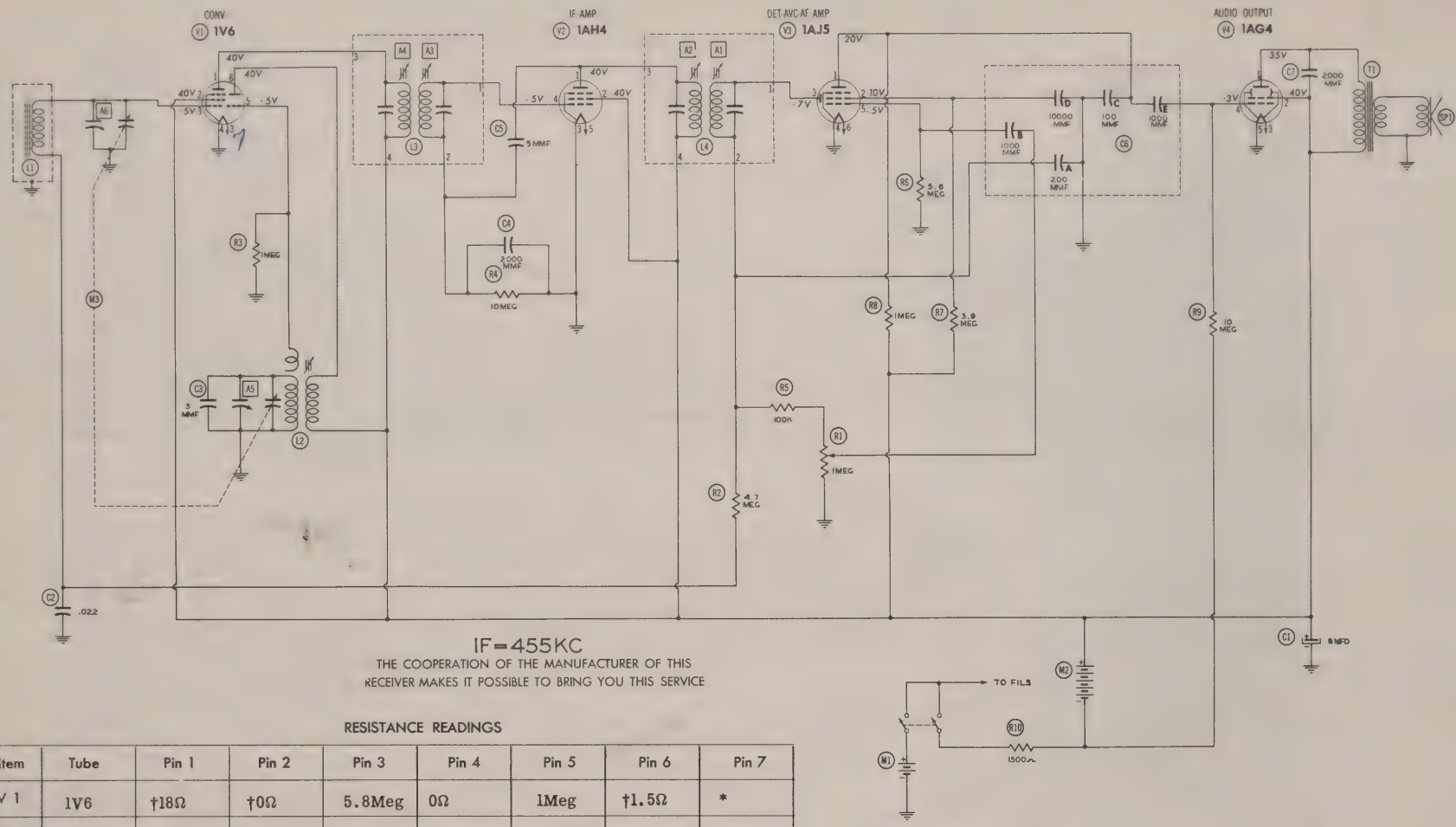
EMERSON
MODEL 747 (Ch. 120178)



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1V6	†18Ω	†0Ω	5.8Meg	0Ω	1Meg	†1.5Ω	*
V 2	1AH4	†18Ω	†0Ω	0Ω	10Meg	*		
V 3	1AJ5	†1Meg	†3.9 Meg	1.1Meg	0Ω	5.6Meg	*	
V 4	1AG4	†635Ω	†0Ω	*	10Meg	0Ω		

† MEASURED FROM "B+" LINE
* DO NOT USED OHMMETER TO MEASURE FILAMENT RESISTANCE

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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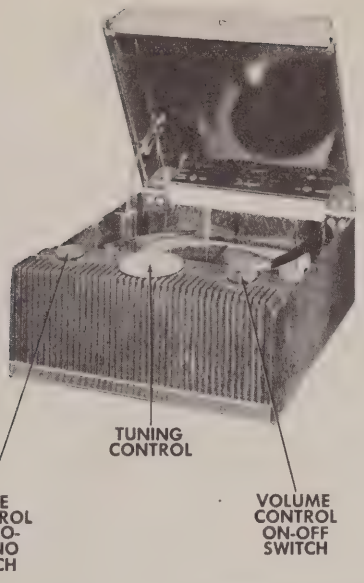
MOTOROLA
MODEL 53F2 (Ch. HS360)



TRADE NAME	Motorola Model 53F2 (Ch. HS360)
MANUFACTURER	Motorola, Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv.-Phono Pre-Amp., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp. 35L6GT Audio Output, 50Y6GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .34 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Connect record changer to receiver during alignment.
CAUTION: A9 (top slug) should not be tampered with since this adjustment is pre-set at the factory through the use of special equipment.

IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	BC	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.

PHONO ALIGNMENT

2.	.1MFD	High side to point (A) Low side to B-.	455KC (400~Mod)	Phono	Tuning gang fully open	"	A4	Adjust for maximum deflection.
3.	Direct	High side to green antenna lead. Low side to B-.	455KC (Unmod)	"	"	"	A5	Adjust A5 (phono osc.) for zero beat with 455KC signal.
4.	"	"	"	"	"	Use VTVM. DC probe to point (B). Common to chassis.	A6	Adjust A6 for -17V on VTVM (this reading may be obtained at two settings. Use reading obtained at higher capacity by adjusting A6 in clockwise direction).
5.		Loop	"	"	"	Not used		Fashion loop of several turns of wire and radiate signal into loop of receiver. Recheck oscillator frequency. If the beat signal exceeds approximately 500 cycles, repeat steps 3 and 4.

RF ALIGNMENT

6.		Loop	1620KC	BC	Tuning gang fully open	Across voice coil	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
7.		"	1400KC	"	Tune to 1400KC signal	"	A8	"

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PARTS LIST AND DESCRIPTIONS

MOTOROLA
MODEL 53F2 (Ch. HS360)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter-Phono Pre-Amp.	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp	12AT6	12AT6	7BT	
V4	Audio Output	35L6GT	35L6GT	7S	
V5	Rectifier	50Y6GT	50Y6GT	7Q	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	80	150	23B621785	AFH1-20		A023			TVL-1420	
C2A	40	300	23B631403 *	AFH4-47		D046		FP423		
B	40	250							TVA-3228	
C	40	250							TVL-1413	
D	40	25								
C3	10	50	23A90205	PRS50/10		BR105		TC32	TVA-1304	
C4	750	500	21R6539	1464-00075		5W5T15		MCB251	MS-37	
C5	.05	200	8R9821	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C6	100		21R410036	SI100N750	TCN-100	TN22	N750T-101	NT-531	5TCU-T1	
C7	1000		21R115860	SI1000	D6-102	TP52	GP2L-102	UC-521	5GA-D1	
C8	1000		21R115860	SI1000	D6-102	TP52	GP2L-102	UC-521	5GA-D1	
C9	.082	200	8R490947			PM4S82				
C10	5		21R120544	SI5NP0	TCN-5	TP06	NP0A-050	ZT-555	5GA-V5	
C11	10000		21R482726	BPD-01	DD-103	K082	811-01	DC-511	5HK-D1	
C12	100		21R410036	SI100N750	TCN-100	TN22	N750T-101	NT-531	5TCU-T1	
C13	.003	600	8R9835	P688-003	D6-302	CUB6D3	GP2-333-302	PT623	6TM-D3	
C14	.001	600	8R9846	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C15	10000		21R482726	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C16	.005	600	8R9869	P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C17	.047	400	8R490232	489ZX-047		PJ4S47		PT4147	4TM-S47	
C18	.15	(455KC)								Note 1
C19	.5-3		21A630699		829-3		3115-01-0R5			

Note 1. Replace with original type unit only. (Reconnect capacitor at 455KC).
* In some sets C2D was a separate capacitor (23A90205-10MFD @ 50V). In these receivers a three section capacitor was used-Part No. 23B621743.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	18A621820	Q13-139X		BT-79-S	UT-454	Volume - tapped @ 400KΩ
B	Switch		Not Req.	76-1		Not Req.	US-26	Attach to R1A
R2	1Meg	½	18B621742					Tone & Phono & Radio Switch

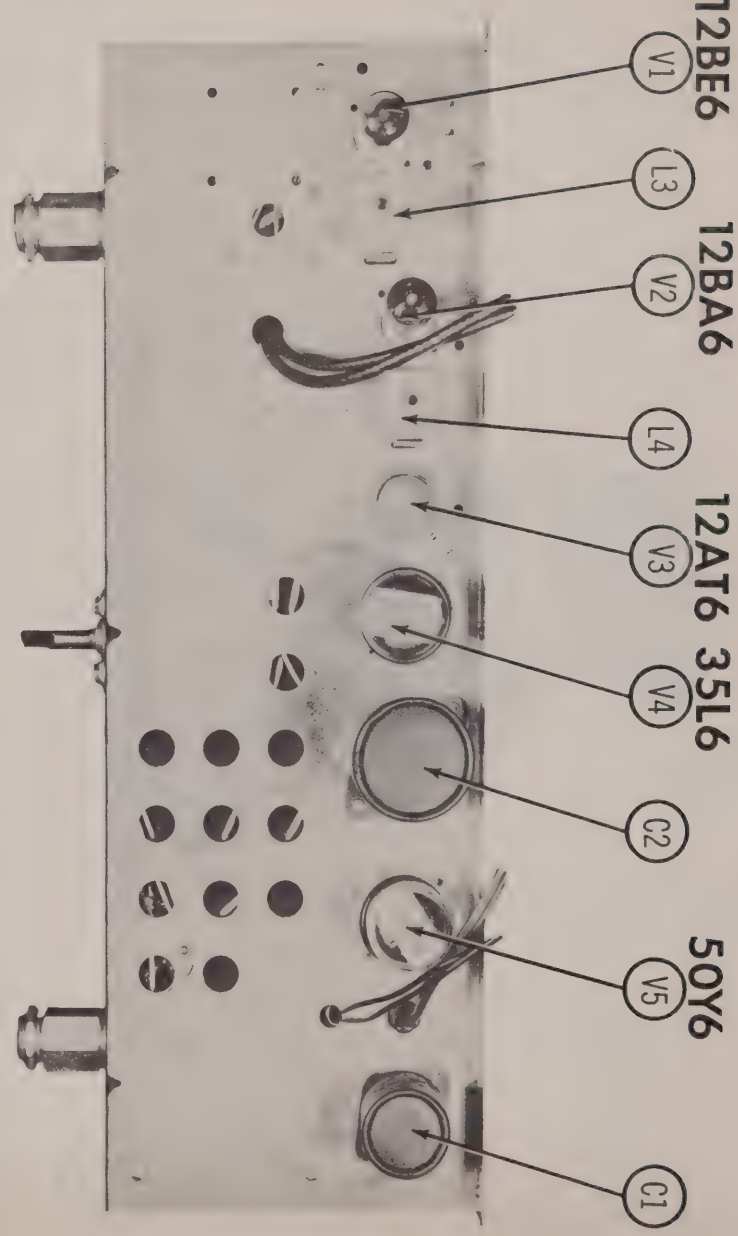
RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	NOTES
R3	1.5Meg	½	6R3966	BTS-1.5Meg	
R4	22KΩ	½	6R6028	BTS-22K	
R5	18KΩ	½	6R6232	BTS-18K	
R6	3.3Meg	½	6R2118	BTS-3.3Meg	
R7	82Ω	½	6R2035	BTS-82	
R8	4.7Meg	½	6R2122	BTS-4.7Meg	
R9	27KΩ	½	6R6434	BTS-27K	
R10	470KΩ	½	6R6032	BTS-470K	
R11	1Meg	½	6R6046	BTS-1Meg	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	NOTES
R12	100KΩ	½	6R6075	BTS-100K	
R13	12KΩ	½	6R6394	BTS-12K	
R14	330KΩ	½	6R6014	BTS-330K	
R15	470KΩ	½	6R6032	BTS-470K	
R16	120Ω	1	6R488021		
R17	100Ω	2	6R3963		
R18	4400Ω	5	17R120502	1 3/4A-4500	
R19	22 Ω		65B630362 †		

† Fuse type resistor.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	5KΩ	3.5Ω	25B621824-A	A-3877①	A-3019	S-5Z	Z1002	T-26S49	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6 x 9"	PM	3.5Ω	50D621841			

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.5Ω		24C630071				Includes panel assy. with trimmer
L2	Radio & Phono Osc. Coil	1.1Ω	8.5Ω	24A630049	14-1073		69-Osc.	
L3	Input IF	13Ω	13Ω	24K630820				
L4	Output IF	35Ω	35Ω	24K630867	16-6770	BC-355	12-C6	

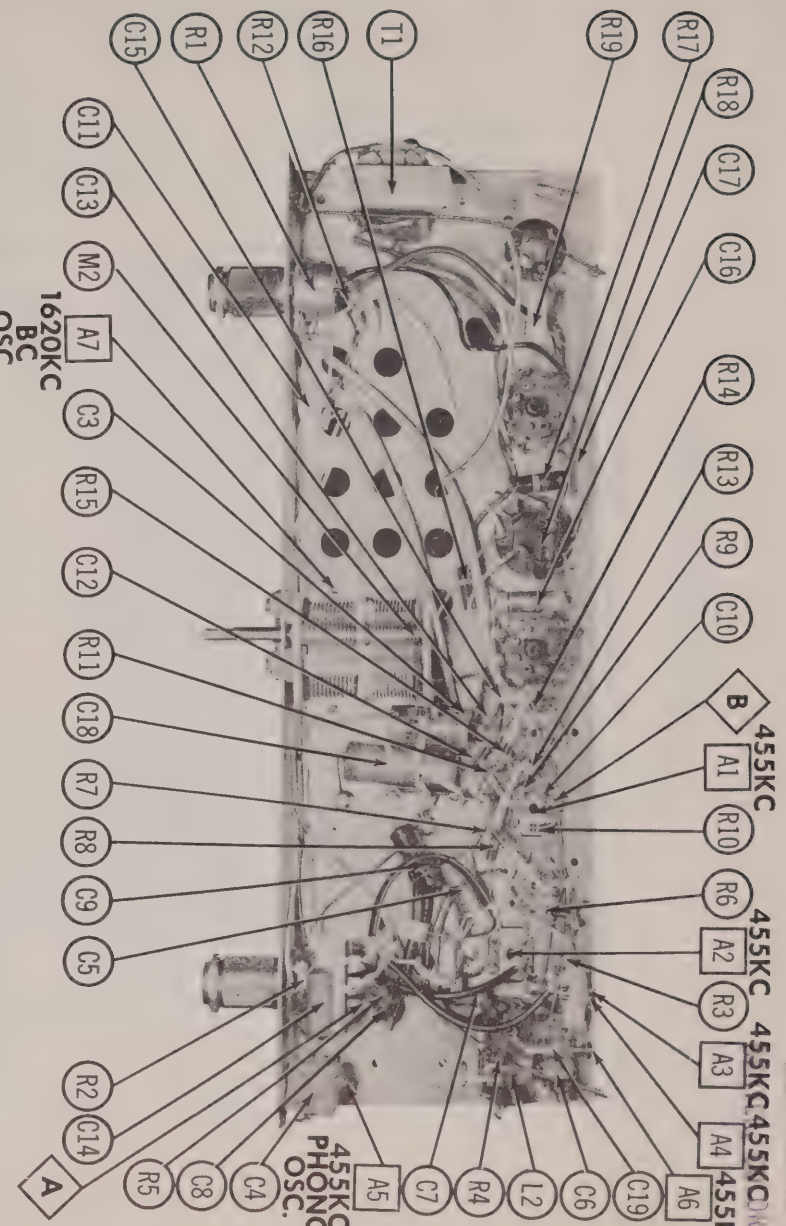
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA						REMARKS
	MOTOROLA PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	1C630821							

MISCELLANEOUS

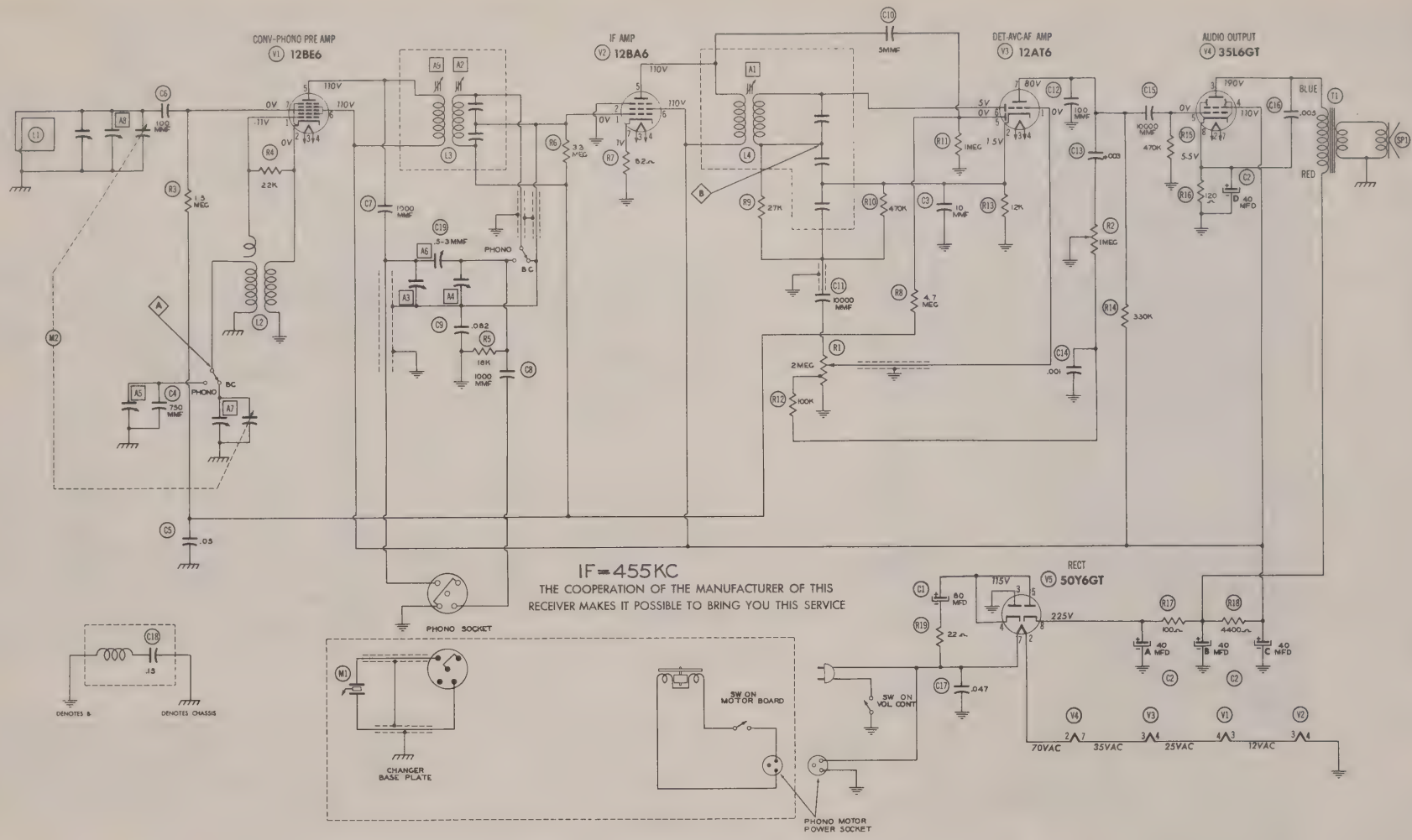
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Tuning Cap.	19B621784	2 Section (10-367MMF, 31-175MMF)
A3,A4	Trimmer Cap.	20A630228	(5-80MMF - each section)
A5	Trimmer Cap.	20A621836	(20-180MMF)
A8	Trimmer Cap.	20A630861	(10-20MMF)
	Cabinet	16F621269	Walnut
	Cover	16E621272	Cabinet
	Knob	36K621827	Off/On/Volume & tone
	Knob	36C622089	Tuning

CHASSIS—BOTTOM VIEW



MOTOROLA
MODEL 53F2 (Ch. HS360)

SET 234 FOLDER 9



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12DE6	22KΩ	1Ω	12Ω	25Ω	†4.5KΩ	†4.5KΩ	7.2Meg	
V 2	12BA6	2Meg	0Ω	13Ω	0Ω	†4.5KΩ	†4.5KΩ	62Ω	
V 3	12AT6	1.5Meg	12KΩ	35Ω	25Ω	1Meg	500KΩ	†335KΩ	
V 4	35L6GT	INF	75Ω	†800Ω	†4.5KΩ	470KΩ	1Meg	35Ω	130Ω
V 5	50Y3GT	INF	75Ω	0Ω	100KΩ	100KΩ	INF	140Ω	150KΩ

† MEASURED FROM PIN 8 OF V5

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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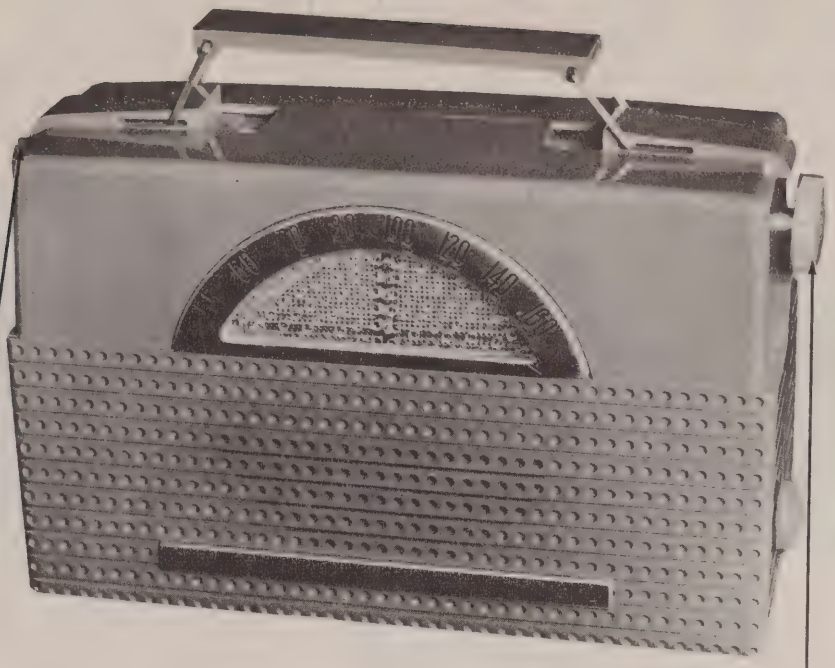
PHILCO
MODELS B-652, 53-652 (Code 121)



VOLUME CONTROL
ON-OFF SWITCH

TUNING
CONTROL

PHILCO
MODELS B-652, 53-652 (Code 121)

TRADE NAME	Philco Model B-652, 53-652 (Code 121)
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY RATING	110-120 Volts AC/DC (or) 1½ Volts "A" Supply & 67½ Volts "B" Supply .12 Amp. @ 117 Volts AC (or) 240MA @ 1½ Volts DC & 8MA @ 67½ Volts DC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Attenuate signal generator to maintain 0.5 volt at output meter.
3.		"	1400KC	Tune to 1400KC signal	"	A5	"
4.		"	600KC	Tune to 600KC signal	"	A6	Adjust for maximum deflection while rocking tuning gang thru 600KC signal.

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PARTS LIST AND DESCRIPTIONS

PHILCO
MODEL B-652, (Code 121)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■50	150	30-2658-39	E3C261		C008			R1159	
B	▲40	150								
C	10	150								
C2	50	25	30-2417-12	PRS50/25		BR502		TC29	TVA-1206	
C3	.05	200	30-4650-45	P288-05	DF-503	PTE4S5		PT415	2TM-S5	
C4	1.5		30-1221-7	S11.5NP0	TCZ-1.5		NP0K-1.5	ZT-5515		
C5	7.5		30-1224-83							
C6	47		60-00475420	S147	D6-470		GP1K-470	UC-5447	5TCU-Q47	
C7	.22	100	30-4656-1	P288-22		PTE4P22		PT4022	2TM-P22	
C8	1.5		30-1221-7	S11.5NP0	TCZ-1.5		NP0K-1.5	ZT-5515		
C9A	4000		30-1239	BPD-004	D6-402	TM5D4	811-004	DCD-524	5HK-D4	
B	4000		30-1239	BPD-004	D6-402	TM5D4	811-004		5HK-D4	
C10A	1000			BPD-001	D6-102		811-001	DC-521	5HK-D1	
B	10000			BPD-01	DD-1032		811-01	DC-511	5HK-S1	
C	220		30-1237	S1220	D6-221		GP2L-221	UC-5322	5GA-T22	
D	2000			BPD-002	D6-202		811-002	DC-522	5HK-D2	
C11	.004	600	30-4650-56	P688-004	D6-402	PTE6D4	GP2-333-402	PT624	6TM-D4	
C12	.047	400	30-4650-45	489ZX-047		PTE4S47		PT4147	4TM-S47	
C13	.1	400	30-4650-47	P488-1		PTE4P1		PT401	4TM-P1	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg	½	33-5566-21					Volume

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	NOTES
R2	820Ω	½	66-1828340	BTS-820	
R3	68KΩ	½	66-3688340	BTS-68K	
R4	470Ω	½	66-1478340	BTS-470	
R5	15KΩ	½	66-3158340	BTS-15K	
R6	3.3Meg	½	66-5338340	BTS-3.3Meg	
R7	2.2 Meg	½	66-5228340	BTS-2.2Meg	
R8	4.7Meg	½	66-5478340	BTS-4.7Meg	
R9	4.7Meg	½	66-5478340	BTS-4.7Meg	
R10	680KΩ	½	66-4688340	BTS-680K	
R11	2.2Meg	½	66-5228340	BTS-2.2Meg	

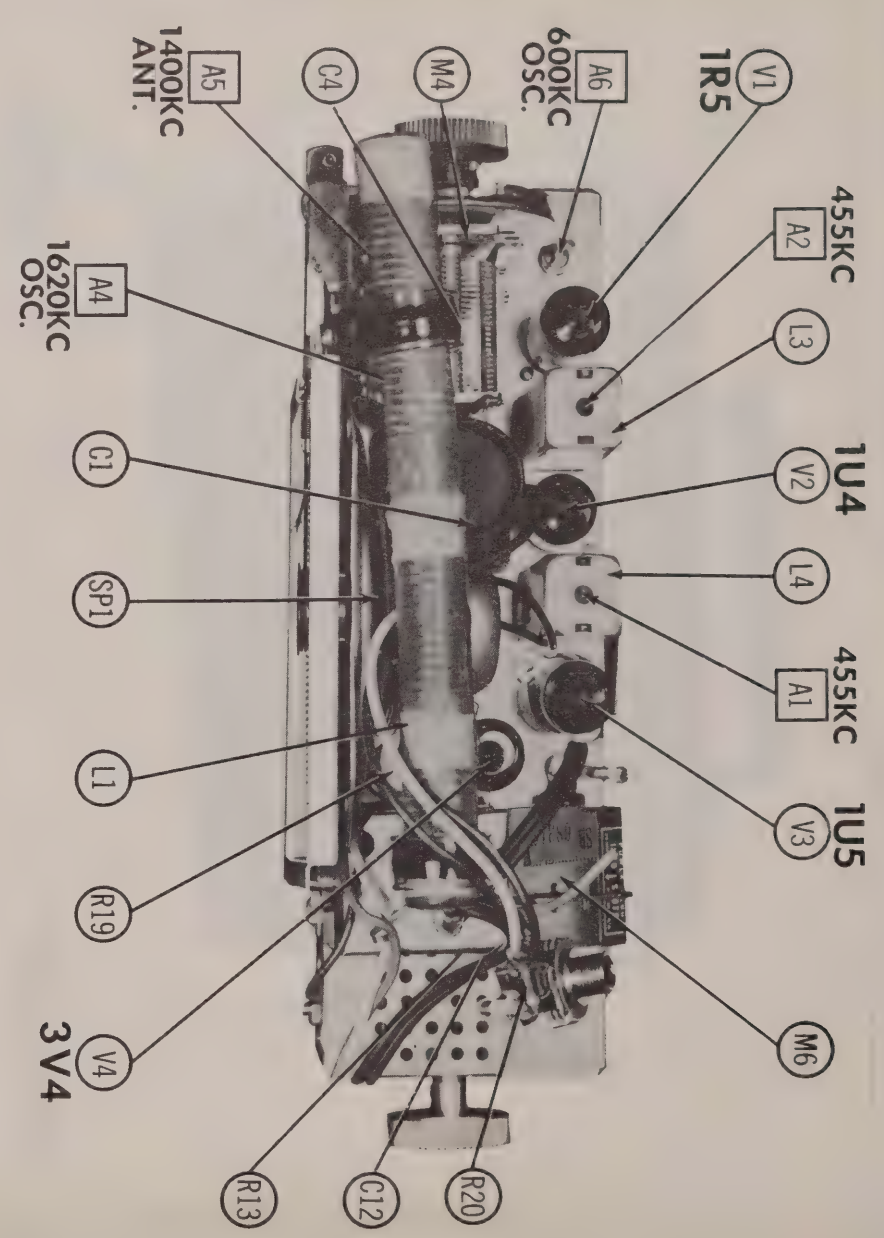
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	NOTES
R12	2200Ω	½	66-2228340	BTS-2200	
R13	820Ω	½	66-1828340	BTS-820	
R14	150Ω	½		BTS-150	Note 1
R15	430Ω	½			
R16	1500Ω	½	66-2158340	BTS-1500	
R17	120Ω	3	33-1334-14		
R18	150KΩ	½	66-4158340	BTS-150K	
R19A	1050Ω	5	33-3445		
B	1050Ω	5	33-3445		
R20	10Ω	½	66-0108340	BTS-10Ω	

Note : Some models may use a 330Ω resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: PHILCO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	9KΩ	3.4Ω	32-8434	A-3329	A-2927 ①	S-11X		TS-24S49	① Drill one new mtg. hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.4Ω	36-1637-2	ST-113 Mod P4-X	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.1Ω	.9Ω	32-4455-9				
L2	Osc. Coil	1.4Ω	6.5Ω	32-4453-1	14-1074		71-Osc.	
L3	Input IF	25Ω	25Ω	32-4160-4A	16-6758	BC-352	12-C1	
L4	Output IF	35Ω	25Ω	32-4454-1A	16-6770	BC-355	12-C6	

SELENIUM RECTIFIER

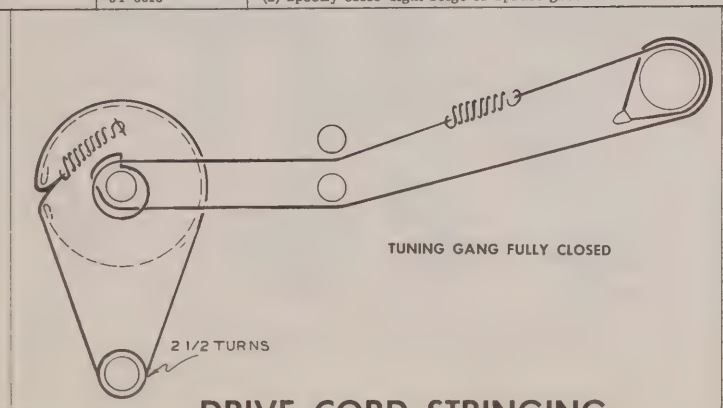
ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	PHILCO PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.068	34-8003	5M4	1003	6S75	75	

BATTERIES

ITEM No.	VOLTAGE	PHILCO PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	1.5V "A"	P77	964			21R			2 used in parallel
M3	67.5V "B"	P144		437			XX50		

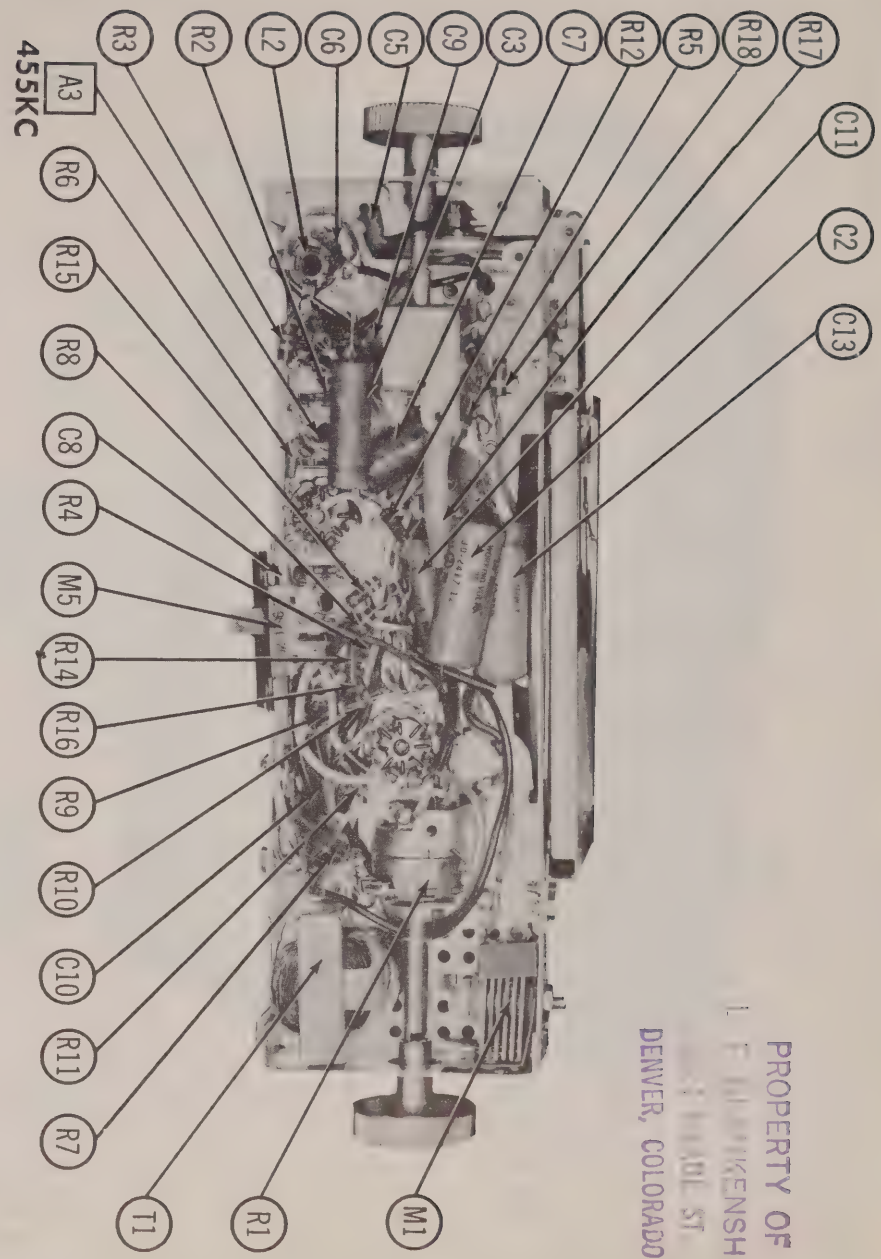
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M4	Tuning cap	31-2735-4	2 section (24-340MMF, 17-15MMF)
M5	Switch	42-1796-3	Battery economizer
M6	Switch	42-1925-1	Power changeover
	Cabinet	10954	Light beige
	Cabinet	10954-2	Spruce green
	Cabinet back	54-6010	Light beige
	Cabinet back	54-6010-1	Spruce green
	Handle	54-6012	Light beige
	Handle	54-6012-1	Spruce green
	Knob	54-6016	(2) specify color-light beige or spruce green



DRIVE CORD STRINGING

CHASSIS—BOTTOM VIEW



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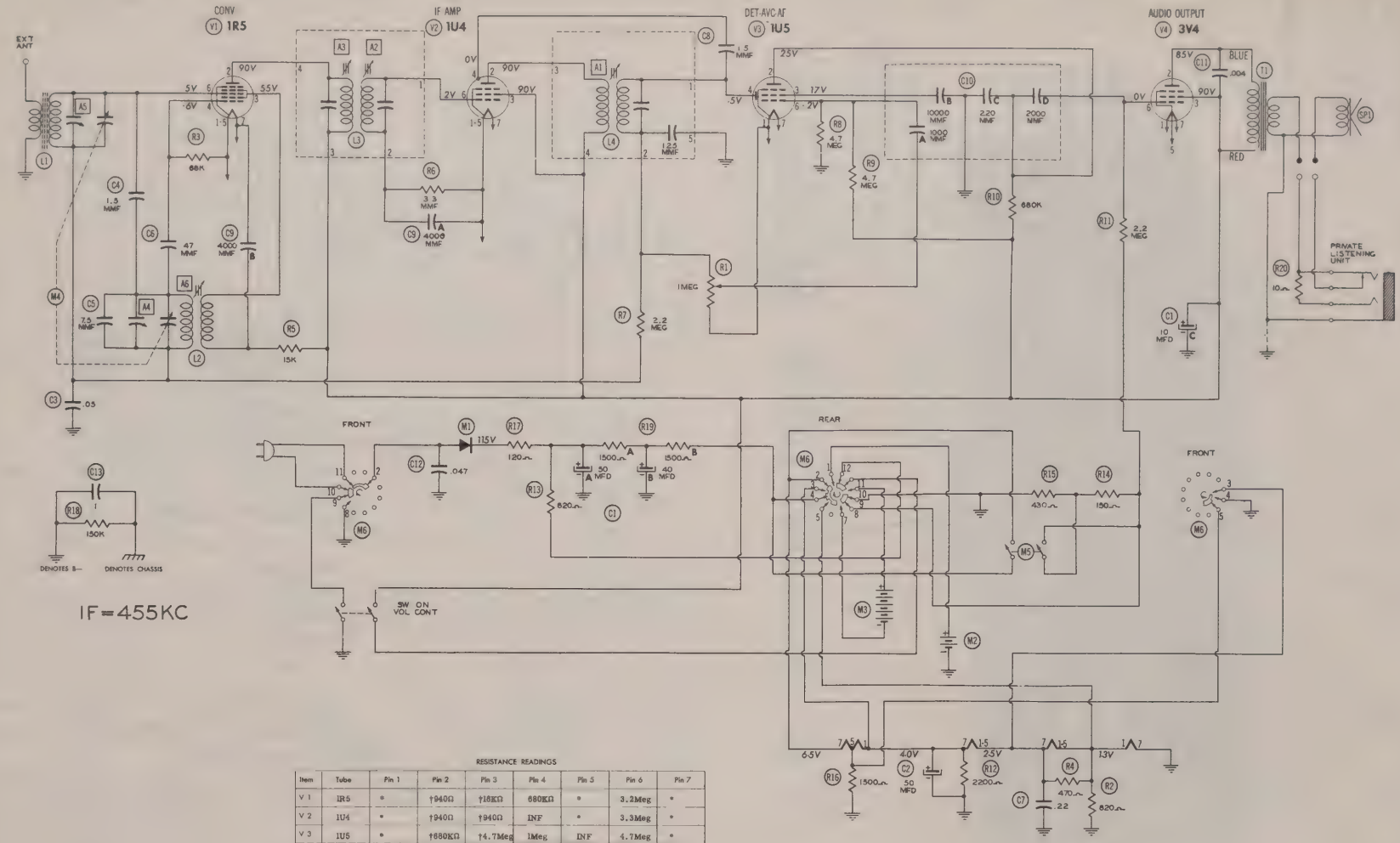

IF=455KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†940Ω	†18KΩ	680KΩ	*	3.2Meg	*
V 2	1U4	*	†940Ω	†940Ω	INF	*	3.3Meg	*
V 3	1U5	*	†680KΩ	†4.7Meg	1Meg	INF	4.7Meg	*
V 4	3V4	*	†1.4KΩ	†940Ω	0Ω	*	2.2Meg	*

† MEASURED FROM OUTPUT OF M1
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with varuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage

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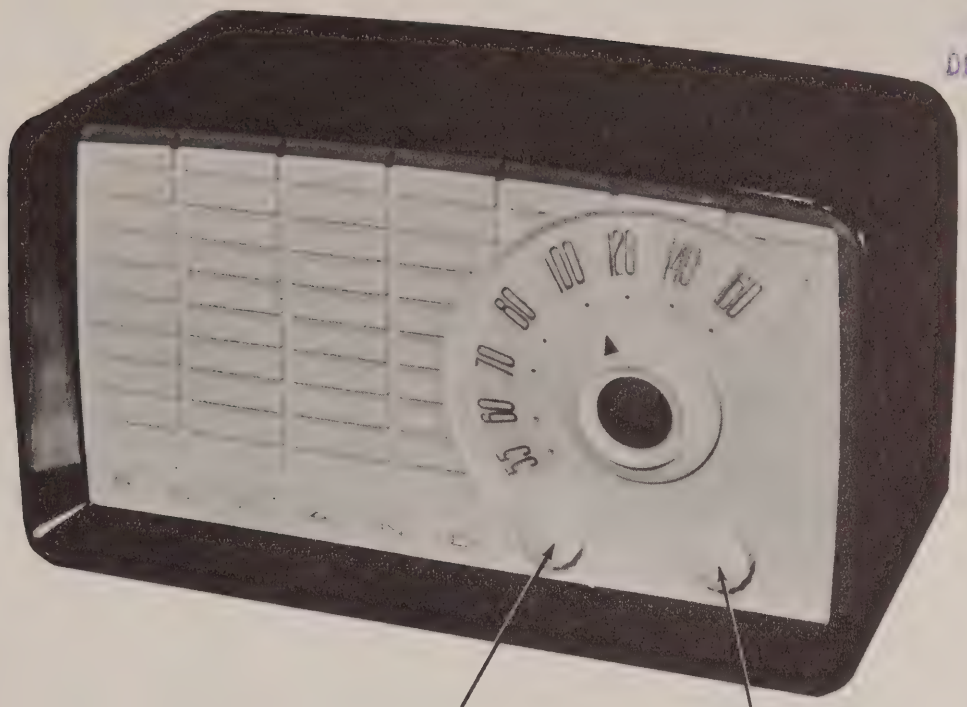

ROLAND
MODEL 5T5

TRADE NAME	Roland Model 5T5
MANUFACTURER	Roland Radio Corp., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC/DC Operated Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .22 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation .
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

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PARTS LIST AND DESCRIPTIONS

ROLAND MODEL 5T5

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		ROLAND PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AF Amplifier	12AT6	12AT6	7BT	
V4	Output	50C5	50C5	5BQ	
V5	Rectifier	35W4	35W4	7CV	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ROLAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150		PRS150/50-30-20		BBRT44215		3N532	TVA-3448	Red
B	40	150								Red
C	20	150								Blue
C2	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	270			SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C4	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C5	270			SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C6	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C7	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C8	.05	400		489ZX-05		PJ4S5		PT415	4TM-S5	
C9	.1	400		P488-1		PJ4P1		PT401	4TM-Q1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ROLAND PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	VC-51	Q13-133	AG-60-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

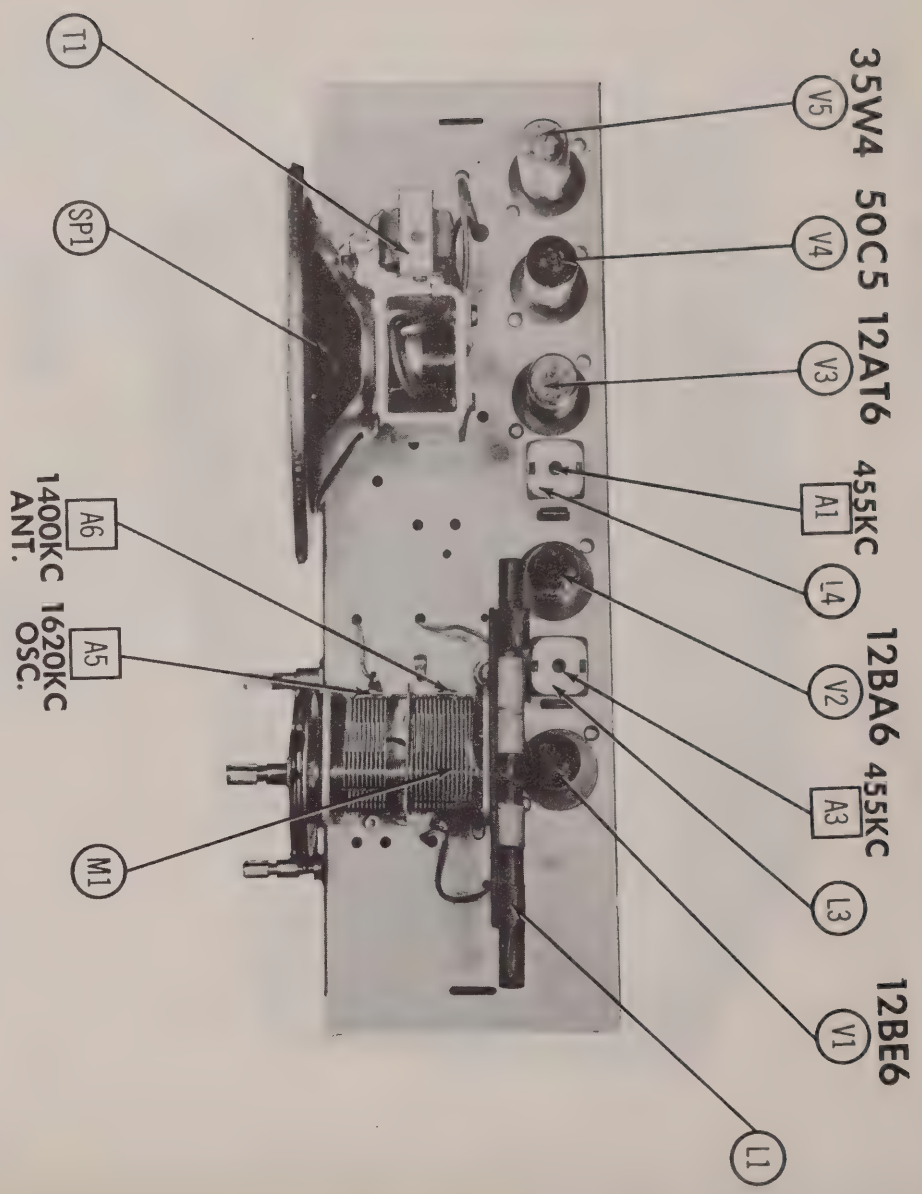
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	220Ω	½		BTS-220	
R4	2.2Meg	½		BTS-2.2Meg	
R5	4.7Meg	½		BTS-4.7Meg	
R6	220KΩ	½		BTS-220K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R7	470KΩ	½		BTS-470K	
R8	150Ω	1		BTA-150	
R9	2200Ω	1		BTA-2200	
R10	330Ω	1		BTA-330	
R11	18Ω	½		BTS-18	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ROLAND PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.6KΩ	3.2Ω		A-3332	A-3025	S-1X ①	Z1101	TS-24S50	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

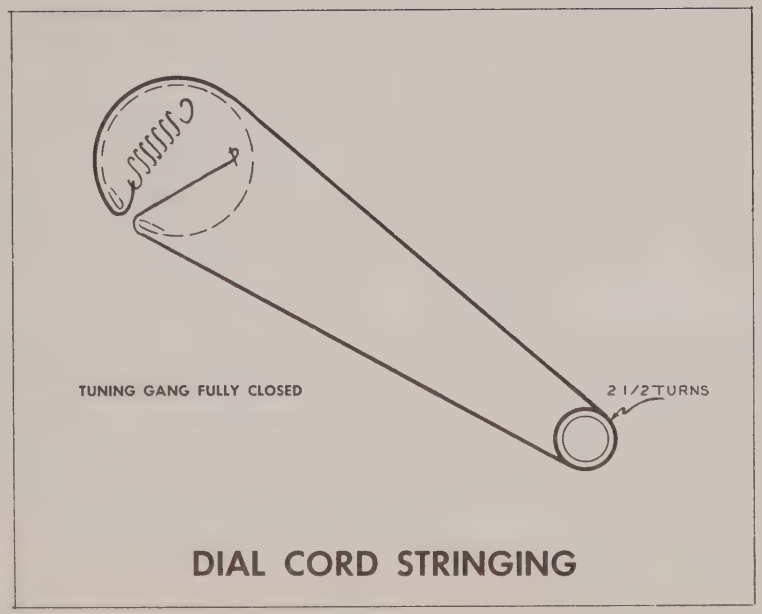
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ROLAND PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.2Ω		ST-105 Mod. P5-X	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ROLAND PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	0Ω	.4Ω	LPFE-14				
L2	Osc. Coil	.6Ω	5.5Ω		14-1073		69-Osc.	
L3	Input IF	20Ω	20Ω	LF-50	16-6758	BC-352	12-C1	
L4	Output IF	20Ω	20Ω	LF-50	16-6758	BC-353	12-C2	

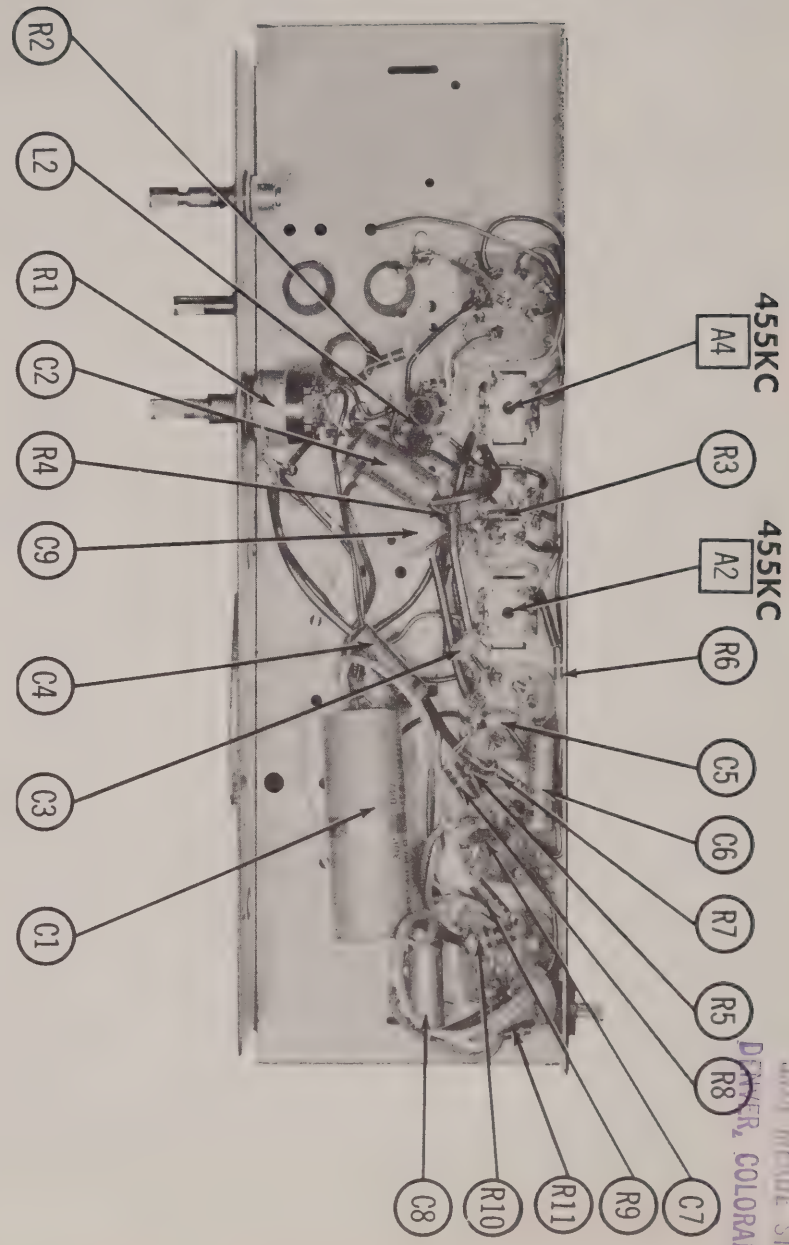
MISCELLANEOUS

ITEM No.	PART NAME	ROLAND PART No.	NOTES
M1	Tuning Cap.	CV-52	2 Section (47-472MMF, 29-195MMF)



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



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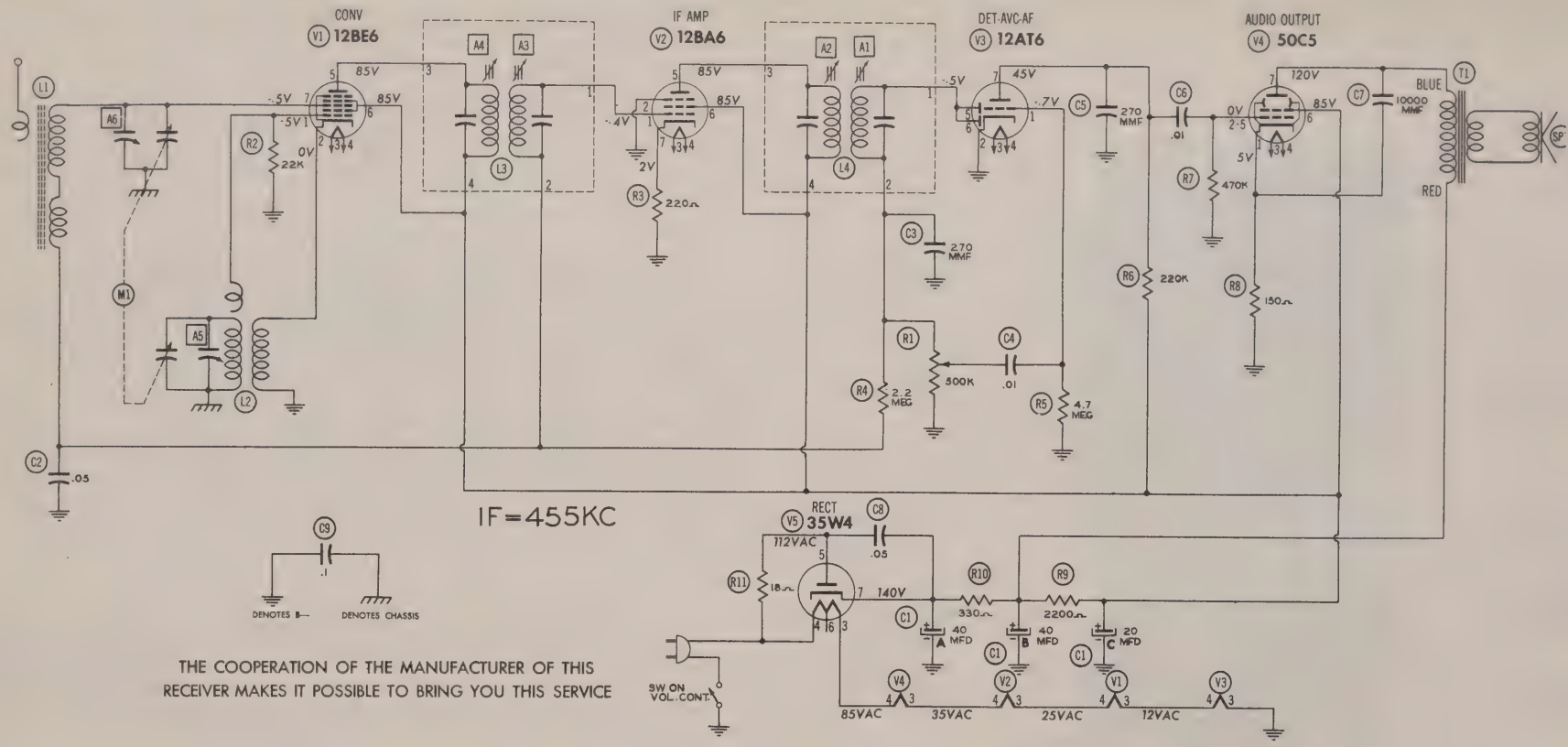
ROLAND MODEL 575



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.5Ω	14Ω	28Ω	†2.5KΩ	†2.5KΩ	2.7Meg
V 2	12BA6	2.7Meg	0Ω	28Ω	40Ω	†2.5KΩ	†2.5KΩ	220Ω
V 3	12AT6	4.7Meg	0Ω	0Ω	14Ω	500KΩ	500KΩ	†220KΩ
V 4	50C5	150Ω	470KΩ	40Ω	90Ω	470KΩ	†2.5KΩ	†500Ω
V 5	35W4	†330Ω	INF	90Ω	125Ω	145Ω	120Ω	100KΩ

† MEASURED FROM PIN 7 OF V5

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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MODEL 821TU

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DATE 3–54 SET 234 FOLDER 12

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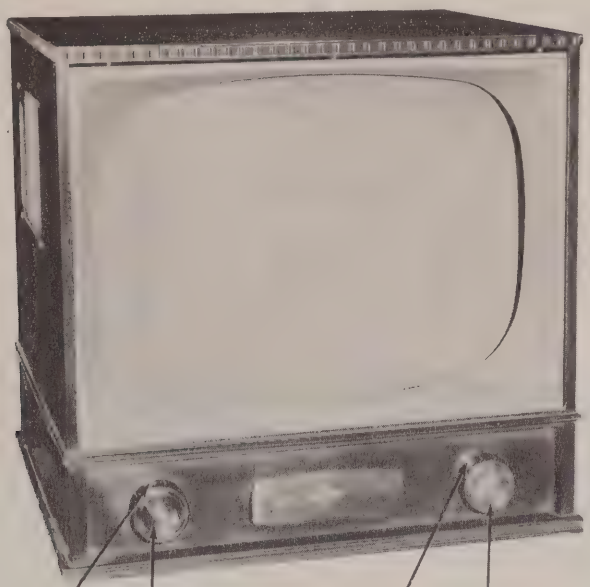

SCOTT MODEL 821TU

TRADE NAME	Scott	MODELS	CHASSIS
		817C, 817T	9043
		821C, 821CB, 821CH	9043
		821D, 821DB, 821DBH, 821DM, 821DMH	9043
		821RC, 821RCH	9043
		821T, 821TB	9043
		821TH, 821TU	9043
MANUFACTURER	Scott Radio Lab., Inc., 1020 N. Rush St., Chicago 11, Ill.		
TYPE SET	Television Receiver		
TUBES	Twenty-one		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 1.64 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 26.1MC, Sound IF 21.6MC (Intercarrier)		

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SCOTT MODELS 817C, T, 821C, CH, DB, DBH, DM, DMH, RC, RCH, T, TH, TU (Ch. 9043)

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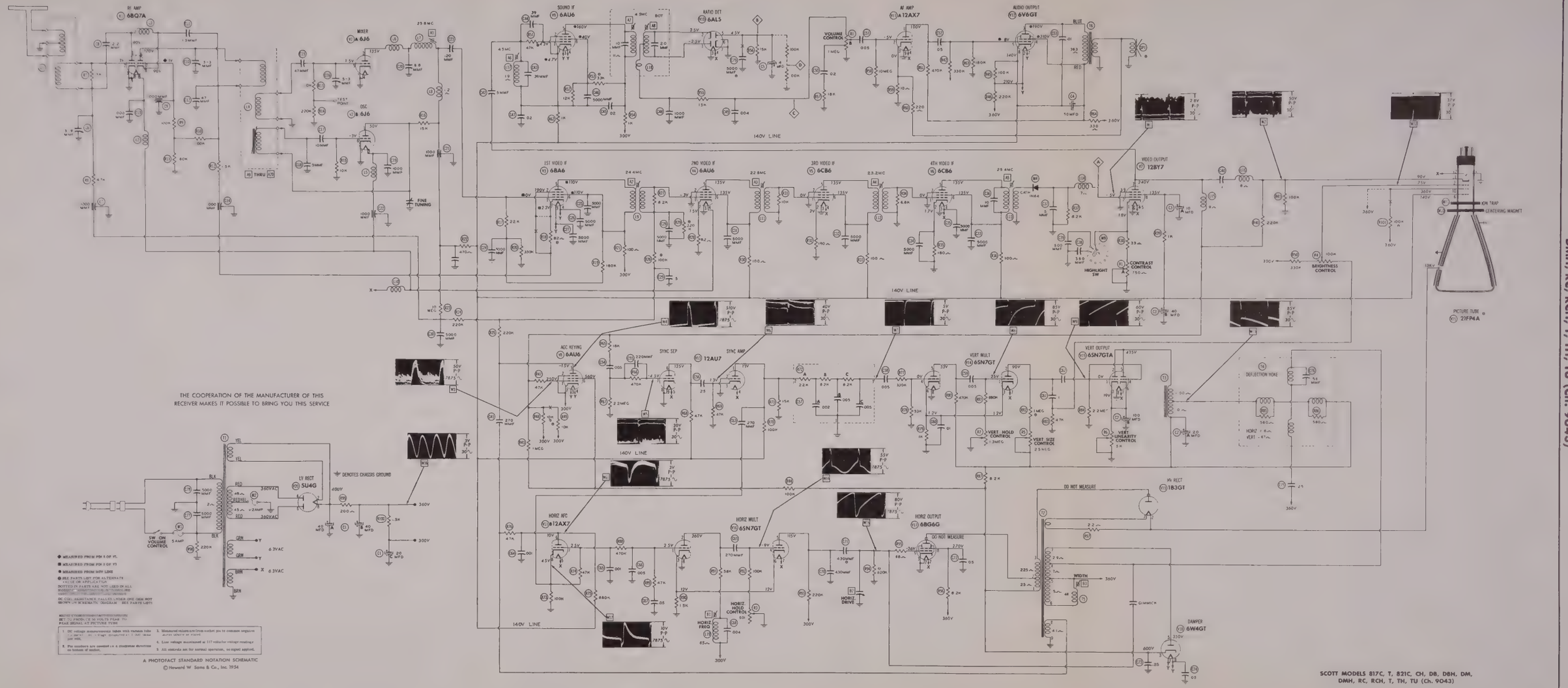

SCOTT MODELS 817C, T, 821C, CH, DB, DBH, DM, DMH, RC, RCH, T, TH, TU (Ch. 9043)

SCOTT MODELS 817C, T, 821C, CH, DB, DBH, DM, DMH, RC, RCH, T, TH, TU (Ch. 9043)

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CHASSIS TOP VIEW

For tube location see tube placement chart page 5.

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CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

SCOTT MODELS 817C, T, 821C, CH, DB, DBH, DM, DMH, RC, RCH, T, TH, TU (Ch. 9043)

TUBE PLACEMENT CHART

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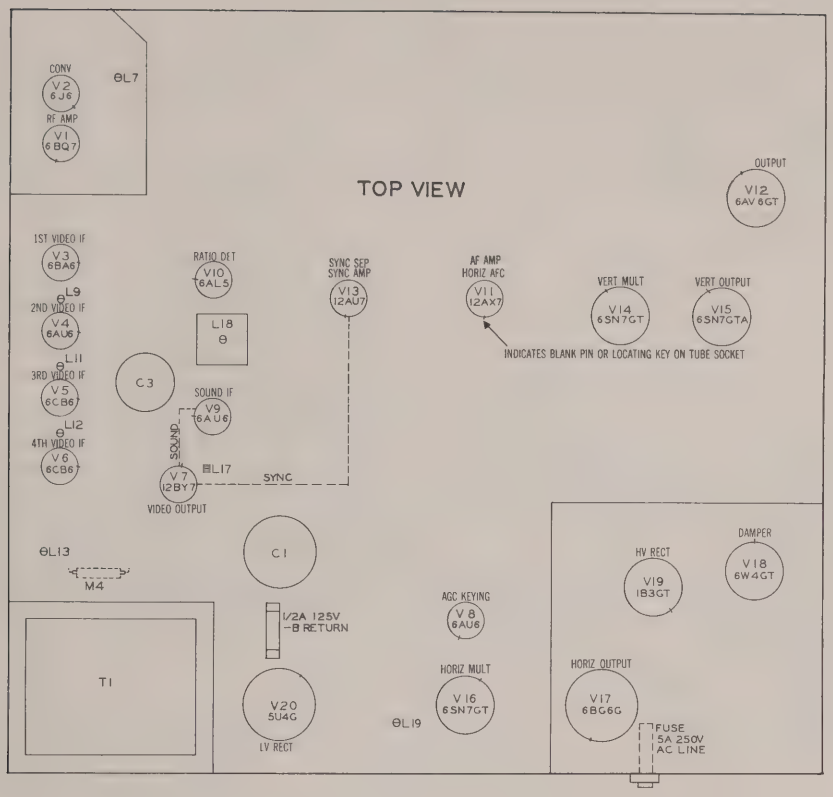

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V20, Fuses (M1 & M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster -V2, V3, V4, V5, V6, V7, V12
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V21
Has pic, no sound -V9, V10, V11, V12
Overloaded picture - V8

SYNC FAILURE
No vert. sync - V13, V14
No horiz. sync - V11, V13, V16
No vert. or horiz. sync - V13

SWEEP FAILURE
No raster, has sound - V16, V17, V18, V19, V21
No vertical deflection - V14, V15
Poor vert. linearity or foldover - V14, V15
Poor horiz. linearity or foldover - V16, V17, V18
Narrow picture - V16, V17, V18, V19, V20
Vert. off freq. - V13, V14
Horiz. off freq. - V11, V13, V16

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. Earlier models, which may be identified by the value of the third video IF grid resistor (R31) will have slightly different peaking frequencies for A1 thru A5. In the early models the value of R31 will be 6800Ω and A1 thru A5 should be peaked at the following frequencies: A1 (25.9MC), A2 (24.3MC), A3 (23.1MC), A4 (22.9MC), A5 (25.7MC). The overall video IF response curve should be the same for both early and late models (Fig.1).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.8MC (Unmod)	Any	DC probe thru 2Meg isolating resistor to point (A). Common to chassis.	A1	Adjust for maximum deflection. Attenuate generator to maintain not more than 1 volt at VTVM.
2.	"	"	24.4MC	"	"	A2	"
3.	"	"	22.8MC	"	"	A3	"
4.	"	"	23.2MC	"	"	A4	"
5.	"	"	25.4MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative side of a 3 volt bias battery to the ungrounded side of C29. Connect the positive lead to chassis. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.6M C 22.7MC 26.1MC	Any	Vert. Amp. thru 100KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig.1. If necessary, retouch A1 thru A5 to obtain desired response.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B). Common to chassis.	A6, A7	Adjust for maximum deflection. Attenuate generator to maintain not more than 5 volts at VTVM.
8.	"	"	"	"	DC probe to point (C). Common to point (D).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C5. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
8.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A8	Reconnect stabilizer capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A7 for maximum amplitude and symmetry of crossover lines.

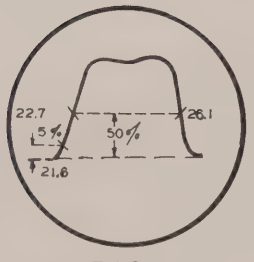

FIG. 1

FIG. 2

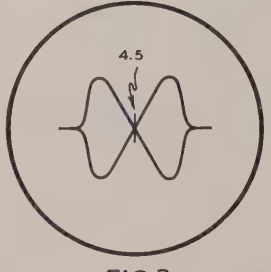

FIG. 3

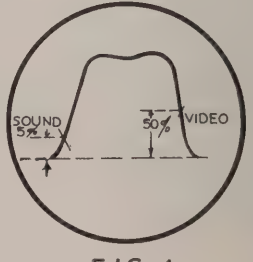

FIG. 4

ALIGNMENT INSTRUCTIONS (cont)

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DENVER, COLORADO

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

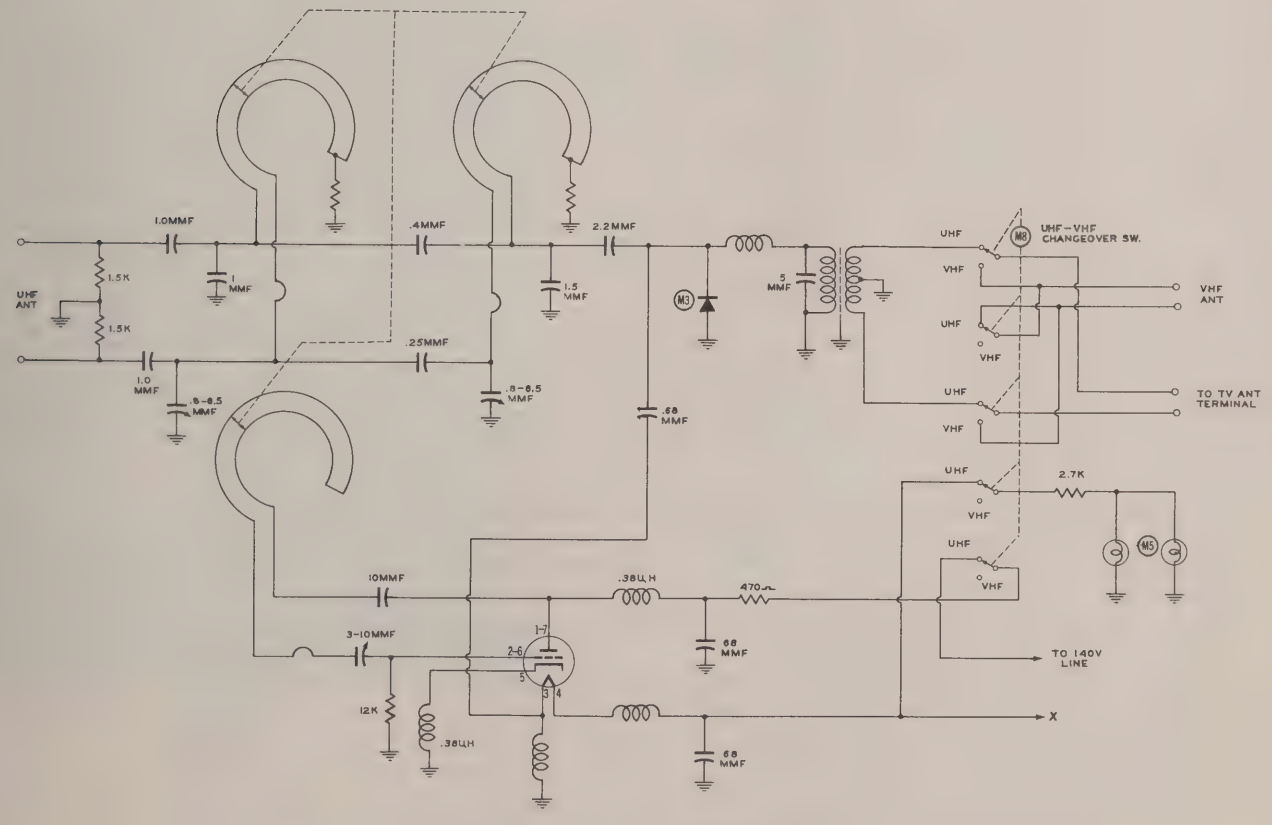
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A9	Adjust to place sound marker as shown in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A10	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A11	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A12	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A13	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A14	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A15	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A16	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A17	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A18	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A19	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A20	

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable.
Alignment of this portion should not be required in the field.

UHF TUNER ALIGNMENT

Alignment of the UHF tuner is not recommended in the field. If alignment of this portion of the receiver becomes necessary the complete UHF tuner unit should be returned to the factory.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

UHF TUNER PART NO. TTC-10015C USED ON SOME MODELS

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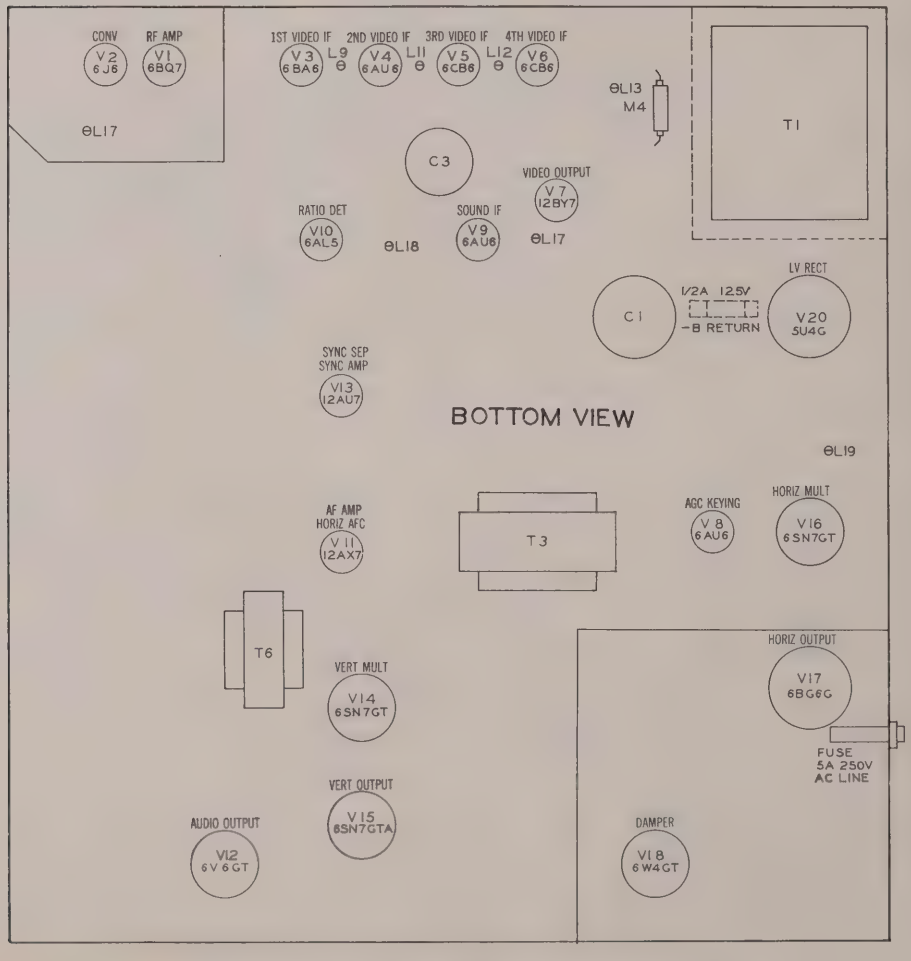
UHF TUNER SCHEMATIC

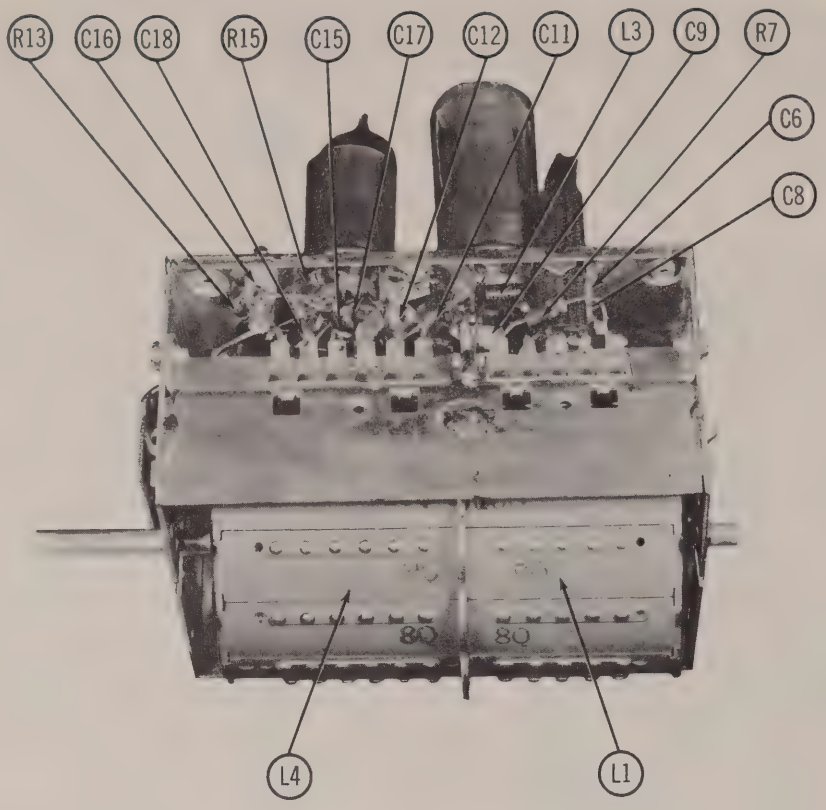
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	600KΩ	0Ω	.1Ω	0Ω	■1.5KΩ	160KΩ	INF	0Ω
V 2	6J6	♦15KΩ	♦ 470Ω	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6BA6	†185KΩ	260KΩ	†220KΩ	†220KΩ	†1.8KΩ	†1.8KΩ	■82Ω		
V 4	6AU6	220KΩ	0Ω	0Ω	.1Ω	♦100Ω	♦100Ω	82Ω		
V 5	6CB6	.1Ω	180Ω	0Ω	.1Ω	♦100Ω	♦100Ω	0Ω		
V 6	6CB6	.1Ω	180Ω	0Ω	.1Ω	♦100Ω	♦100Ω	0Ω		
V 7	12BY7	120Ω	8.2KΩ	0Ω	.1Ω	.1Ω	0Ω	†7KΩ	♦1KΩ	0Ω
V 8	6AU6	†54KΩ	†1.7KΩ	†220KΩ	†220KΩ	540KΩ	▲100KΩ	†1.7KΩ		
V 9	6AU6	♦48KΩ	♦1KΩ	†220KΩ	†220KΩ	†2.7KΩ	♦12KΩ	♦1KΩ		
V 10	6AL5	1Meg	1Meg	0Ω	.1Ω	0Ω	0Ω	15KΩ		
V 11	12AX7	†470KΩ	10Meg	10Ω	.1Ω	.1Ω	47KΩ	150KΩ	100KΩ	0Ω
V 12	6V6GT	INF	†220KΩ	†900Ω	†530Ω	†160KΩ	INF	†220KΩ	60KΩ	
V 13	12AU7	15KΩ	0Ω	47KΩ	.1Ω	.1Ω	♦4.7KΩ	2.7Meg	0Ω	0Ω
V 14	6SN7GT	1.4Meg	▲2.2Meg	1KΩ	33KΩ	▲470KΩ	1KΩ	.1Ω	0Ω	
V 15	6SN7GTA	2.2Meg	▲9.5KΩ	1.4KΩ	2.2Meg	▲9.5KΩ	1.4KΩ	.1Ω	0Ω	
V 16	6SN7GT	620KΩ	†7.5KΩ	1.5KΩ	140KΩ	†220KΩ	1.5KΩ	.1Ω	0Ω	
V 17	6BG6G	4Ω	.1Ω	0Ω	47KΩ	820KΩ	INF	0Ω	†8.4KΩ	TOP CAP ▲25Ω
V 18	6W4GT	INF	INF	450KΩ	INF	†210Ω	INF	♦220KΩ	♦220KΩ	
V 19	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP ▲250Ω
V 20	5U4G	INF	60KΩ	INF	53Ω	INF	50Ω	INF	60KΩ	
V 21	21FP4A	0Ω	†160KΩ	PIN 6 ♦0Ω	PIN 10 100KΩ	PIN 11 100KΩ	PIN 12 .1Ω			

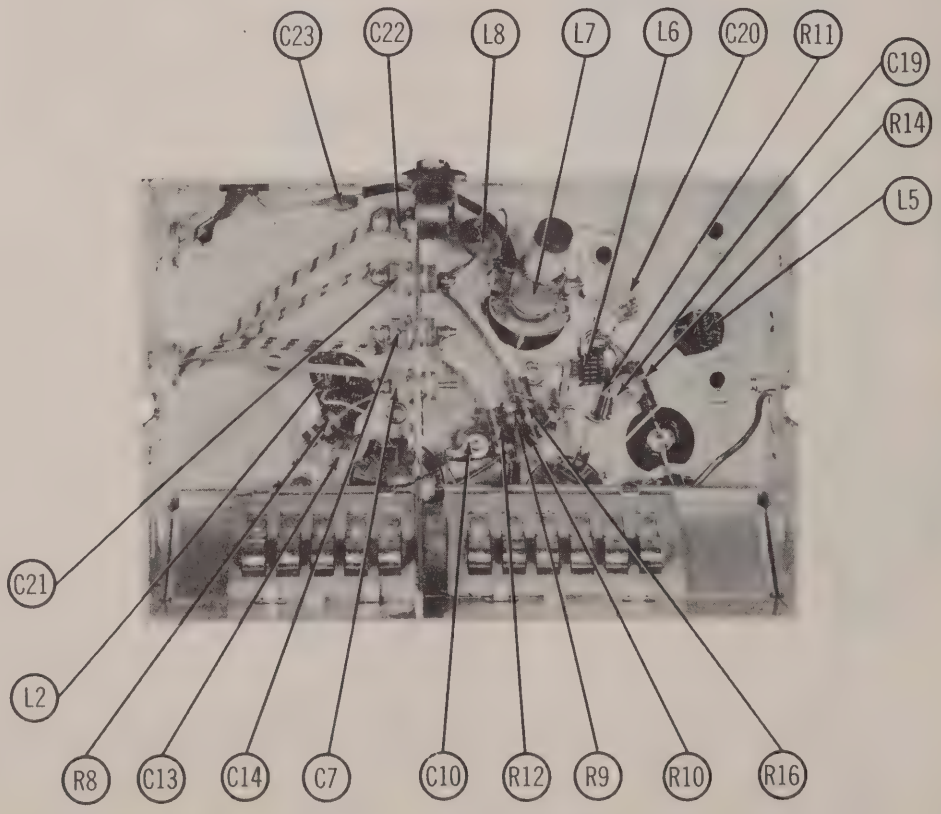
■ MEASURED FROM PIN 2 OF V3
♦ MEASURED FROM 140V LINE
† MEASURED FROM PIN 8 OF V20
▲ MEASURED FROM PIN 3 OF V18



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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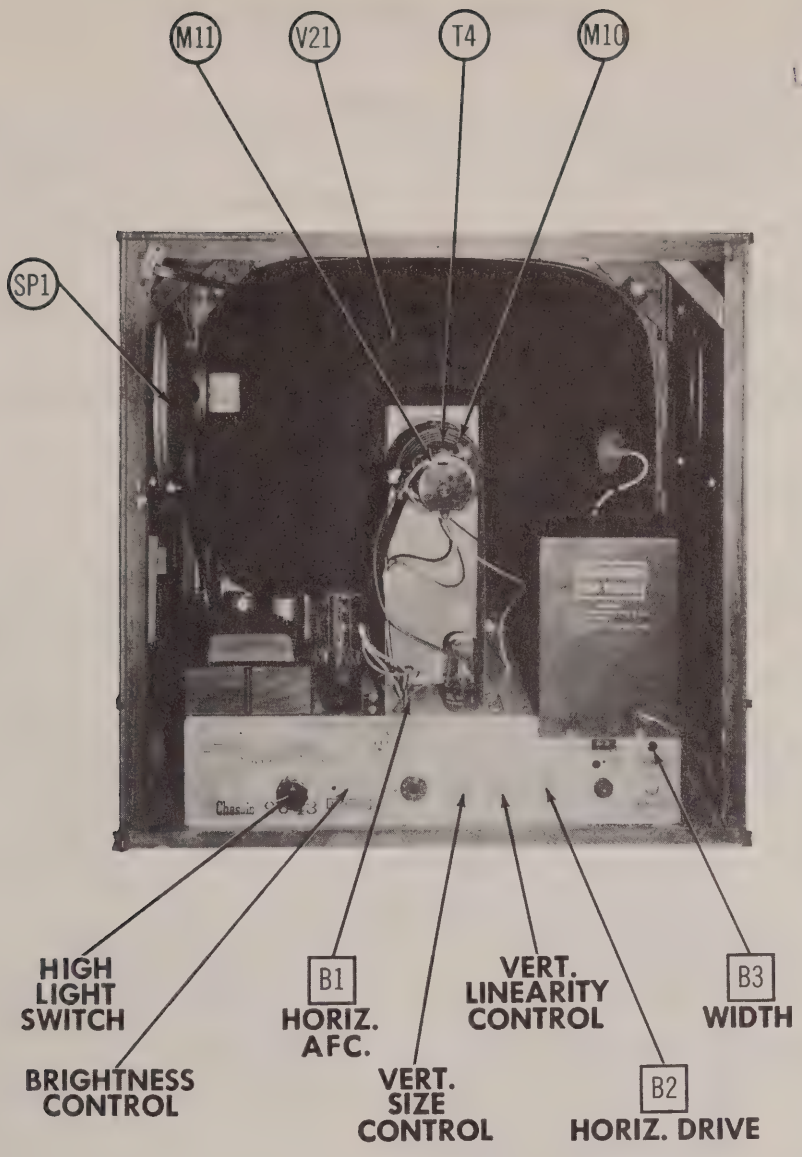

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) to its maximum counter clockwise postion without the presence of vertical white lines or compression near the center of the picture.

Adjust the width slug (B3) for a picture that is slightly wider than necessary to fill the picture mask horizontally.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V16, V17, V18 and V20. Check adjustments B2 and B3. Check waveform W15.

If Satisfactory	If Unsatifactory
Check C72, C73, C74, C75, R96, T2, T4A and other associated components.	Check C69, C70, C71, R90, R93, R94 and other associated circuit components.

DRIVE LINES

Check adjustment B2. Check by substitution V16, V17 and V18. Check C69, C70, C71, C72, C73, C74, C75, R96, R93, R94, T2, T4A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V17 and V18. Check adjustments B2 and B3. Check components associated with the horizontal output and damper stages especially T2 and T4A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Substitute V16, V17 and V18. Check C66, for open. Check T2, T4A, T5 and other associated components.

XMAS TREE EFFECT

Substitute V16. Check C68, C69, L19 and other associated components for failure or change of value.

VERTICAL

LOSS OF SWEEP

Check by substitution V14 and V15. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check T3, T4B, and other associated circuit components.	Check R87, C62, R83, R84 and other associated components.

INSUFFICIENT SWEEP

Check adjustment of vertical size and linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V14 and V15. Check T3, T4B, C2B and other associated circuit components.

COMPRESSED AT TOP

Check by substitution V14 and V15. Check C59, C60, C61, R80, R82, R83,C62 R84 and other associated components.

FOLDS

Substitute V14 and V15. Check associated components for failure or change of value.

SYNC

LOSS OF HORIZONTAL AND VERTICAL SYNC

Substitute V13. Check associated components especially C54, C56, R68, and R70.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V13 and V14. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check components associated with V14.	Check vertical integrator network and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V11 and V16. Check associated components especially C69, C63, C64 and C68.

HORIZONTAL BENDING

Substitute V11, V16 and V17. Check horizontal AFC filter network components (C65, C66, C67, R88, R89) for failure or change of value.

VIDEO

LOSS OF VIDEO

Check C40, R41, L16, picture tube and other associated circuit components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best picture and sound. Check video IF alignment .

POOR CONTRAST

Substitute V7. Check video detector crystal and assembly. Check picture tube and other associated components for failure or change of value.

NEGATIVE PIX

Substitute V7 and V8. Check video detector crystal and assembly. Check AGC network for component failure.

SMEAR

Substitute V7. Check video detector crystal and assembly. Check C40, R39, R40, R41, L15, L16, picture tube and other associated circuit components for failure or change of value.

WIDE BLACK BAR ACROSS PIX

Check V1, V2, V3, V4, V5, V6 and V7 for heater to cathode leakage. Check B+ filter capacitors.

AUDIO

WEAK OR NO SOUND

Chech by substitution V9, V10, V11 and V12. Check stages V11A and V12 using an audio signal generator. Apply audio signal across R58.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V11A and V12 especially C52.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A8 for minimum buzz. If still unsatisfactory, substitute V10 and realign audio IF and detector stages.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

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DENVER, COLORADO

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

SCOTT MODELS 817C, T, 821C, CH, DB, DBH, DM, DMH, RC, RCH, T, TH, TU (Ch. 904ε)

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: SCOTT PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6BA8	6BA8	7BK	
V4	2nd. Video IF Amp.	6AU8	6AU8	7BK	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Output	12BY7	12BY7	9BF	
V8	AGC Keying	6AU8	6AU8	7BK	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amplifier - Horiz. AFC	12AX7	12AX7	9A	
V12	Audio Output	6V6GT	6V6GT	7S	
V13	Sync Separator-Sync Amp.	12AU7	12AU7	9A	
V14	Vert. Mult.	6SN7GT	6SN7GT	8BD	
V15	Vert. Output	6SN7GTA	6SN7GTA	8BD	
V16	Horiz. Mult.	6SN7GT	6SN 7GT	8BD	
V17	Horiz. Output	6BG6G	6BG6G	5BT	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rectifier	1B3GT	1B3GT	3C	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SCOTT PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V21A	21FP4A	21FP4A	21FP4A	21FP4A	12L	① Add high voltage filter capacitor.
B	17HP4	21FP4 ① 17HP4	21FP4 ① 17HP4	17HP4	12M 12L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	SCOTT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No	NOTES
C1A	±40	450	CLC-10075	AFH4-79		B045		FP947	TVL-3786	
B	±40	450				BR2045				
C	±20	450								
C2A	20	450	CLC-10050	PR8450/20		BR2045		TC75	TVA-1709	Blue
B	100	25		PR825/100		BR8251		TC2501	TVA-1207	Yellow
C3A	±10	250	CLC-10074	AFH3-38		C023		FP350.7	TVL-3417	
B	±40	350								
C4	50	350	CLA-10087C	PR8450/50		BR5035		TC68	TVA-1715	
C5	4	50	CLA-10037A	PR825/4		BR415		TC30	TVA-1402	
C6	3-9				829-10					
C7	1000		EF-001		MFT-1000				503C-D1	
C8	2.2		SI2.2NP0		TCS-2.2		MP0K-2R2		5TCCB-V22	
C9	1000		EF-001		MFT-1000				503C-D1	
C10	.5-3				828-3			C7565A		
C11	1.5		SI1.5NP0		TCS-1.5		MP0K-1R5	ZT-5515	5TCCB-V15	
C12	47		BPD-000047		D6-470		GP2K-470	UC-5447	5GA-Q47	
C13	1000		BPD-001		DD-102	TM5D1	501-001	DC-521	5HK-D1	
C14	1000		EF-001		MFT-1000				503C-D1	
C15	47		BPD-000047		D6-470		GP2K-470	UC-5447	5GA-Q47	
C16	.5-3				828-3			C7565A		
C17	10		SI10NP0		TCS-10		MP0K-100	ZT-541	5TCC-Q1	
C18	5									
C19	1000		BPD-001		DD-102	TM5D1	501-001	DC-521	5HK-D1	
C20	5.6		SI6.8NP0		TCS-6.8		MP0K-6R8	ZT-5568	5TCCB-V56	
C21	1000		EF-001		MFT-1000				503C-D1	
C22	1000		EF-001		MFT-1000				503C-D1	
C23	120		BPD-00012		D6-121	TM5T12	GP2K-121	UC-5312	5GA-Y12	
C24	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	
C25	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	
C26	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	
C27	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	Note 1
C28	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	
C29	.5	200		P288-5		P73P5		PT405	2TM-P5	
C30	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	
C31	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	
C32	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	
C33	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	
C34	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	
C35	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	
C36	10			SI10NP0	TCS-10		MP0K-100	ZT-541	5TCC-Q1	
C37	5			SI5NP0	TCS-4.7		MP0K-050	ZT-555	5TCCB-V47	
C38	330	500								
C39	1500	500								
C40	.1	600		P688-1		DF-104	PTK6P1	PT621	6TM-P1	
C41	270	500		1469-0003			5R5T3		M3-33	
C42	5			SI5NP0	TCS-4.7		MP0K-050	ZT-555	5TCCB-V47	
C43	39	500		1469-00004			5R5Q4		M3-44	
C44	39	500		1469-00004			5R5Q4		M3-44	
C45	.02	600		P688-02	DF-203		PTK6S3	PT623	6TM-S2	
C46	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	
C47	.02	600		P688-02	DF-203		PTK6S3	PT623	6TM-S2	
C48	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C49	.004	400		P688-004	D6-402		PTK6P4	GP2-333-402	6TM-P4	
C50	.02	600		P688-02	DF-203		PTK6S2	PT612	6TM-S2	
C51	.005	600		P688-005	D6-502		PTK6D5	GP2-333-502	PT625	6TM-D5
C52	.05	600		P688-05	DF-503		PTK6S5		PT615	6TM-S5
C53	.01	1000		P1088-01			PTK16S1		PTR11	MB-S1
C54	.005	600		P688-005	D6-502		PTK6D5	GP2-333-502	PT625	6TM-D5
C55	.25	600		S2330	DF-253			GP2K-321	UC-5322	5GA-T23
C56	.25	600		684-25			PTK6P25		PT6025	6TM-P25
C57A	.002						PTK6D2		PT622	
B	.005		≠CMX-10012	≠PA-112	≠PC-100		PTK6D5	≠1405-01	PT625	≠10C1
C	.005						PTK6D5		PT625	
C58	.005	600		P688-005	D6-502		PTK6D5	GP2-333-502	PT625	6TM-D5

CAPACITORS (cont)

ITEM No.	RATING: CAP.	VOLT	SCOTT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No	NOTES
C59	.005	600		P688-005	D6-502	PTK6D5	GP2-333-502	PT625	6TM-D5	
C60	.01	600		P688-01	D6-103	PTK6S1		PT611	6TM-S1	
C61	.1	600		P688-1	DF-104	PTK6P1		PT601	6TM-P1	
C62	.1	600		P688-1	DF-104	PTK6P1		PT601	6TM-P1	
C63	270	500		1469-0003			5R5T3		M3-33	
C64	.001	600		P688-001	D6-102	PTK6D1	GP2L-102	PT621	6TM-D1	
C65	.001	600		P688-001	D6-102	PTK6D1	GP2L-102	PT621	6TM-D1	
C66	.005	600		P688-005	D6-502	PTK6D5	GP2-333-502	PT625	6TM-D5	
C67	.05	600		P688-05	DF-503	PTK6S5		PT615	6TM-S5	
C68	.004	400	CPA-14402B	1464-004		DR6D4			M3-34	
C69	270	500		1469-0003			5R5T3		M3-33	
C70	430	500								Note 2
C71	430	500								
C72	.05	600		P688-05	DF-503	PTK6S5		PT615	6TM-S5	
C73	.25	600		684-25		PTK6P25		PT6025	6TM-P25	
C74	.05	600		P688-05	DF-503	PTK6S5		PT615	6TM-S5	
C75	.25	600		684-25		PTK6P25		PT6025	6TM-P25	
C76	.56	2000								
C77	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	
C78	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	
C79	5000		CMX-10002	BPD-005	DD-502	TM5D5	511-005	DC-525	5HK-D5	Note 1

Note 1. Not used in all Models.
Note 2. Some models use 270MMF.
≠ Items C57A, C57B, C57C, R72A, R72B, R72C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	SCOTT PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	750Ω	½	VCA-12140	≠ QJ-521	RTV-645		UF75I-T52	Contrast tapped at 400Ω (panel)
B	1Meg	½	Not Req.				UR6-T254 †	Volume tapped at 250KΩ (rear)
C	Switch		Not Req.				U8-26	Attach to R1B
R2A	1.5Meg	½	VC-12132	Q1J-138	AG-83-S	AB-69	U-155	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS2-3	AK-4	Not Req.	Attach to R2A
R3A	50KΩ	½	VC-12131	Q1J-123	AG-44-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS2-3	AK-4	Not Req.	Attach to R3A
R4A	100KΩ	½	VCA-12135	Q1J-128	AG-49-S	AB-40	SU-41	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	2.5Meg	½	VC-12121	Q1J-239	AG-84-S	AB-83	U-255	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	5000Ω	½	VC-12120	Q1J-114	AG-19-S	AB-10	U-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A

† Universal replacement (Mallory exact duplicate Part No. UR18S).
≠ CONCENTRIKIT EQUIVALENT KIT - K-3 BASE ELEMENTS & SHAFS B17-105X & P1-210 (Panel) B13-137X & H2-226 (Rear) & SWITCH 76-L.

RESISTORS

ITEM No.	RATING: OHMS	WATT	SCOTT PART No.	IRC PART No.	NOTES
R7	15KΩ	½		BTS-15K	
R8	47KΩ	½		BTS-47K	
R9	100KΩ	½		BTS-100K	
R10	100KΩ	½		BTS-100K	
R11	160KΩ	½		BTS-160K	
R12	1500Ω	½		BTS-1500	
R13	10KΩ	½		BTS-10K	
R14	220KΩ	½		BTS-220K	
R15	10KΩ	½		BTS-10K	
R16	15KΩ	½		BTS-15K	
R17	22KΩ	½		BTS-22K	
R18	82Ω	½		BTS-82	Note 7
R19	180KΩ	5%		BTS-180K 5%	≠
R20	330KΩ	5%		BTS-330K 5%	
R21	100Ω	½		BTS-100	
R22	470Ω	½		BTS-470	
R23	10Meg	½		BTS-10Meg	
R24	220KΩ	½		BTS-220K	1
R25	220KΩ	½		BTS-220K	1
R26	100KΩ	½		BTS-100K	Note 1
R27	8200Ω	½		BTS-8200	
R28	82Ω	½		BTS-82	
R29	220KΩ	½		BTS-220K	Note 2
R30	100Ω	½		BTS-100	
R31	10KΩ	½		BTS-10K	
R32	180Ω	½		BTS-180	
R33	10Ω	½		BTS-10	
R34	6800Ω	½		BTS-6800	
R35	180Ω	½		BTS-180	
R36	10Ω	½		BTS-10	
R37	8200Ω	½		BTS-8200	
R38	33Ω	½		BTS-33	
R39	1000Ω	½		BTS-1000	
R40	220KΩ	½		BTS-220K	
R41	100KΩ	½		BTS-100K	
R42	330KΩ	5%		BTS-330K 5%	
R43	1Meg	½		BTS-1Meg	
R44	100KΩ	½		BTS-100K	
R45	10KΩ	½		BTS-10K	
R46	220KΩ	½		BTS-220K	
R47	47KΩ	½		BTS-47K	
R48	10KΩ	2		BTS-10K	Note 5
R49	10KΩ	2		BTS-10K	Note 5
R50	330KΩ	½		BTS-330K	
R51	47KΩ	½		BTS-47K	
R52	12KΩ	½		BTS-12K	
R53	33KΩ	½		BTA-33K	Note 3
R54	1000Ω	½		BTS-1000	

ITEM No.	RATING: OHMS	WATT	SCOTT PART No	IRC PART No.	NOTES
R55	15KΩ	½		BTS-15K	
R56	15KΩ	½		BTS-15K	
R57	18KΩ	½		BTS-18K	
R58	10Meg	½		BTS-10Meg	
R59	10Ω	½		BTS-10	
R60	230Ω	½		BTS-220	
R61	470KΩ	½		BTS-470K	
R62	100KΩ	½		BTS-100K	
R63	180KΩ	5%		BTS-180K 5%	
R64	33KΩ	1		BTA-330	
R65	18KΩ	½		BTS-18K	
R66	470KΩ	½		BTS-470K	
R67	2.2Meg	½		BTS-2.2Meg	
R68	4700Ω	½		BTS-4700	
R69	47KΩ	½		BTS-47K	
R70	100KΩ	½		BTS-100K	
R71	15KΩ	½		BTS-15K	
R72A	22KΩ	½	≠CMX-10012	BTS-22K	
B	8200Ω	1		BTS-8200	
C	8200Ω	1		BTS-8200	
R73	100KΩ	½		BTS-100K	
R74	47KΩ	½		BTS-47K	
R75	680KΩ	½		BTS-680K	
R76	47KΩ	½		BTS-47K	
R77	330KΩ	½		BTS-330K	
R78	33KΩ	½		BTS-33K	
R79	1000Ω	½		BTS-1000	
R80	470KΩ	½		BTS-470K	
R81	680KΩ	½		BTS-680K	
R82	1Meg	½		BTS-1Meg	Note 4
R83	4700Ω	½		BTS-4700	
R84	2.2Meg	½		BTS-2.2Meg	
R85	560Ω	½		BTS-560	
R86	560Ω	½		BTS-560	
R87	8200Ω	2		BTB-8200	
R88	470KΩ	½		BTS-47 OK	
R89	47KΩ	½		BTS-47K	
R90	1500Ω	½		BTS-1500	
R91	560Ω	½		BTS-5600	
R92	100KΩ	½		BTS-100K	
R93	220KΩ	½		BTS-220K	
R94	820KΩ	½		BTS-820K	Note 6
R95	68Ω	½		BTS-68	
R96	8200Ω	2		BTB-8200	
R97	2.2Ω	½			
R98	220KΩ	1		BTA-220K	
R99	200Ω	10		1 3/4A-200	
R100	1500Ω	1		BTA-1500	
R101	100KΩ	½		BTS-100K	Note 8

≠ Items R72A, R72B, R72C, C57A, C57B, C57C are combined in one unit.
Note 1. Some models may use a 270KΩ resistor in this application.
Note 2. Some models may use a 100KΩ resistor in this application.
Note 3. Some models may use a 39KΩ resistor in this application.
Note 4. So me models may use a 820KΩ resistor in this application.
Note 5. Some models may use a single 5000Ω 4 watt resistor in this application.
Note 6. Some models mau use a 1Meg resistor in this application.
Note 7. Some models may use a 68Ω resistor in this application.
Note 8. Not used in all models.

TRANSFORMER (POWER)

ITEM No	RATING: PRI	SEC 1	SEC 2	SCOTT PART No	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No	Hallicrafters PART No	Thordarson PART No.
T1	117VAC ① 1.64A	730VCT .200ADC	5VAC ② 3A	TPC-10011	P-8169	P-3059	R-37BC		P9131 ①	T-26R15
	SEC 3	SEC 4	SEC 5							
	6.3VAC ③ 1.66A	6.3VAC ④ 3.3VAC								

① Tape 6.3V 1.2A winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	SCOTT PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Hallicrafters PART No.	Thordarson PART No.
T2	Horiz. Output Tran.	THC-10017C				23JT1 & 21HR1 ①		
T3	Vert. Output Trans.	TOB-10045H	A-8123	A-3037	A-102X	22JT1	Z1804	
T4A	Yoke-Horiz. (10MH)	YDB-10001C	DY-8A	MDF-70	T-21 ③	20HD1 ③	DF501	
B	Yoke-Vert. (41MH)	YDB-10001A ②						
T5	Width Coil (.05MH-.3MH)	TOA-10023C	WC-1	MWC-2 ④		20IR1		

① Alternate horizontal output trans.
② Alternate Deflection Yoke.
③ Use original deflection coil network.
④ Enlarge mounting hole.
⑤ See Fig. 1 of instruction booklet packed with unit for terminal connections.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	SCOTT PART No	Stancor PART No.	Merit PART No	Triad PART No.	Hallicrafters PART No	Thordarson PART No	NOTES
T6	5.2KΩ	3.5Ω	TOC-10035	A-3877	A-2930	S-3X	Z1000	TS-245-51	

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	SCOTT PART No	VIKING PART No	QUAM PART No.	NOTES
SP1A	8"	PM	3.5Ω	SR-10025 ①	57P	8A2I	① Used in models 817T, 821T, and 821TE.
B	10"	PM	2.5Ω	SR-10024 ②	10J1I	10A3I	② Used in models 817C, 821C, 821CH, 821RC, and 821RCH.

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	SEC.	SCOTT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coils	0Ω CT	0Ω					
L2	Fil. Choke	0Ω						
L3	Neutr. Coil	0Ω						
L4	RF, Mixer Grid & Osc. Coils	0Ω						
L5	Fil. Choke	0Ω						
L6	RF Choke	0Ω						
L7	1st. Video IF	.9Ω						
L8	RF Choke	1.2Ω						
L9	2nd. Video IF	.1Ω	.1Ω	TSA-10054B	17-1062	TV-116	6250	
L10	Fil. Choke	0Ω		LGA-10018A	19-3001	TV-178	6175	.4 Microhenry
L11	3rd. Video IF	.1Ω	.1Ω	TSA-10054B	17-1063	TV-116	6249	
L12	4th. Video IF	.1Ω	.1Ω	TSA-10054B	17-1063	TV-116	6249	
L13	5th. Video IF	.1Ω	.1Ω	TSA-10054B	17-1064	TV-116	6250	
L14	Series Peaking Coil	7Ω		LGA-10032	19-3125		6153	120 Microhenries
L15	Shunt Peaking Coil	9Ω		LGA-10033	19-3180	TV-184	6180	180 Microhenries
L16	Series Peaking Coil	8Ω		LGA-10034	19-3093	TV-181	6177	100 Microhenries
L17	Sound IF	1.9Ω		TSA-10050C	17-3400	TV-151	1470	
L18	Ratio Det.	1Ω	.32CT	TSB-10062A	17-1053	TV-110	1460	Tertiary winding -.25Ω
L19	Horiz. Osc.	65Ω		LGA-10017B	19-1576	TV-163	6310	

FUSES

ITEM No.	TYPE	RATING	SCOTT PART No.: FUSE	SCOTT PART No.: HOLDER	LITTELFUSE PART No.: FUSE	LITTELFUSE PART No.: HOLDER	BUSS PART No.: FUSE	BUSS PART No.: HOLDER
M1	3AG	5A 250V			312005. (3AG-5A)	341001	MTH5	HKP
M2	3AG/S/B	1/2A 125V			313.500 (3AG S/B-1/2A) (2 used)	121002	MDL 1/2 (2 used)	4592

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SCOTT PART No.	SYLVANIA PART No.		
M3					UHF Mixer
M4	1N64		1N132		Video detector (pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SCOTT PART No.	NOTES
M5	Dial Light	DB-1000	(2) UHF only #47 Bayonet
M6	Tuner	TTC-10015C	UHF
M7	Tuner	TT-10014	VHF
M8	Switch	VSA-10022	UHF-VHF changeover
M9	Switch	VSA-10012	"HIGHLIGHT" control (picture fidelity)
M10	Centering Magnet	MDA-10002	
M11	Ion Trap	ITA-10003	
B2	Trimmer Cap.	CTA-10005	Horiz. Drive (25-280MMF)
	Cabinet	ZW-10147	Model 817C, 821C, 821CH
	Cabinet	ZW-10157	Model 817T, 821T, 821TH
	Cabinet	ZW-10190	Model 821RC, 821RCH
	Cabinet	ZW-10191A	Model 812DB, 821DBH
	Cabinet	ZW-10192	Model 821DM, 821DMH
	Dial	DWC-10054	UHF Models
	Knob	KA-10148	Vert. & horiz. hold 817C & T, 821C, T, RC, DM
	Knob	KB-10152	UHF tuning
	Knob	K-10135	Off/on/volume
	Knob	K-10136	Fine tuning
	Knob	K-10137	Channel Indicator
	Knob	K-10138	Contrast
	Knob	K-10151	Horiz. Hold - "H" Models only
	Knob	K-10142	Vert. Hold - "H" Models only
	Mask	MRB-10140	Picture tube 17"
	Mask	MRB-10135	Picture tube 21" Models 821RC, RCH, DM, DMH, DB, DBH
	Mask	MRB-10145	Picture tube 21" Models 821C, T, TH, CH
	Safety Glass	DWC-10041	Models 817C, T, 821C, T, TH, CH, DB, DBH
	Safety Glass	DWC-10048	Models 821RC, RCH, DM, DMH

TROUBLE SHOOTING AIDS (cont)

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POWER

DEAD SET

If filaments fail to light, check fuse M1, AC interlock assembly, switch on volume control and T1. If filaments light, check fuse M2 . Substitute V20. Check B+ filter components.

SMALL AND/OR DIM PIX

Substitute V20. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V16, V17, V18 and V19. Check waveform W15.

If Satisfactory	If Unsatisfactory
Check R97, T2, T4A, C72, R96 and other associated circuit components.	Check C68, C69, C70, C71, R90, R93, R94, and other associated circuit components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V16, V17, V18, V19 and V20. Check picture tube. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V16, V17, V18, V19 and V20. Check R97, T2, T4A, C72, R96, picture tube and other associated circuit components for failure or change of value.

GENERAL

RASTER SOUND NO PIX

Follow procedure outlined under "Loss of Video".

RASTER PIX NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO SOUND NO PIX

Check by substitution V1, V2, V3, V4, V5, V6, V7 and V8. Check associated circuit components for failure or change of value.

NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

INTERMITTENT STREAKS

Check video signal for interference pulses. Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft.

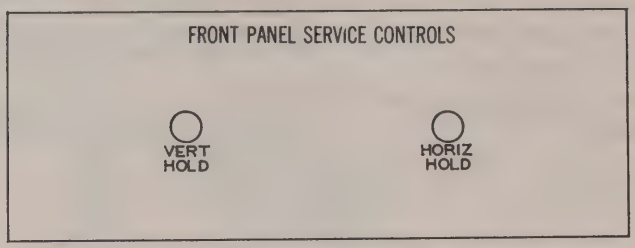
PICTURE TUBE SAFETY GLASS CLEANING

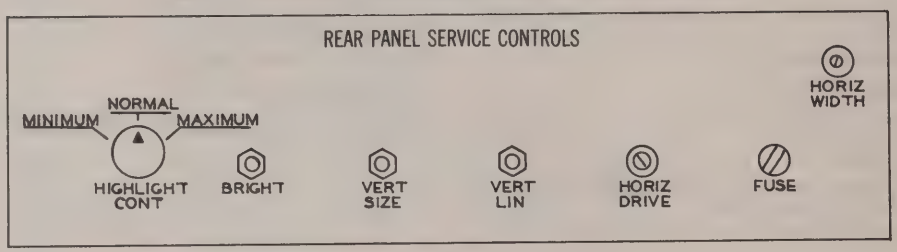
To clean safety glass remove three wood screws holding wood strip at top of safety glass. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. Set the Horiz. Hold Control at the Mid-position of its range and adjust the Horiz. Freq. slug until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary (L18) located on bottom of chassis. (See tube placement chart).

FUSES

Two fuses are used. One for LV power supply protection and one for AC line protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of the picture tube located flush against the yoke. Turn the knurled knob and at the same time rotate the ring around the tube until picture is properly centered.

DISASSEMBLY INSTRUCTIONS

Remove 4 push on type control knobs from front panel.

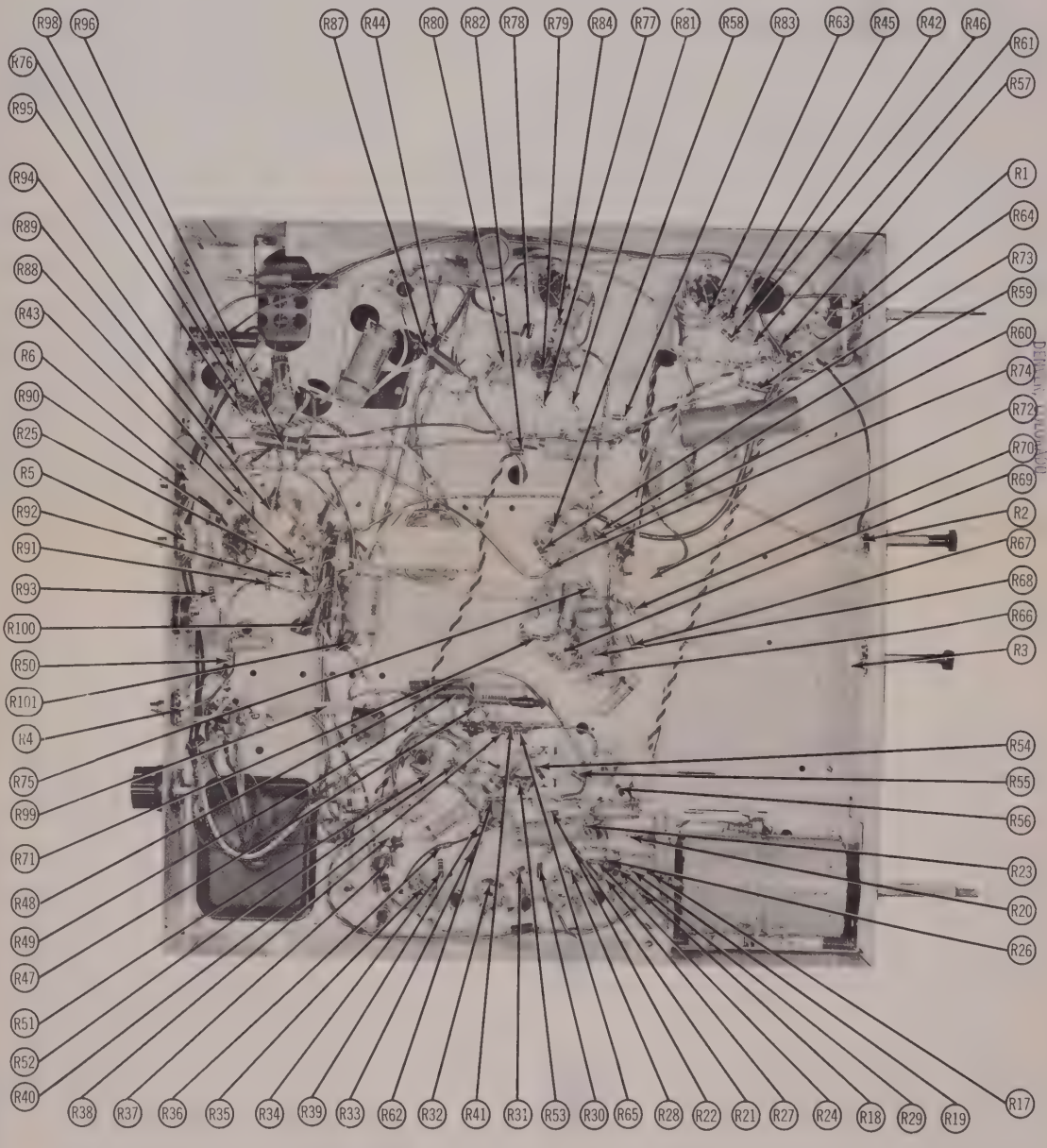
Disconnect built-in antenna.

Remove 8 wood screws. Remove rear cover.

Disconnect speaker leads. Remove 2 wood screws. Remove transmission lines.

Remove 4 chassis bolts and 2 wood screws from CRT bracket. Remove chassis.

Remove 2 speaker nuts. Remove speaker.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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PAGE 20

PHOTOFACT* Folder

SYLVANIA MODELS SERIES 105-14, 105-14U, 120-20, 120-20U, 300, 300U, 301, 301U, 306, 306U, 320, 325, 325U, 326, 326U (Ch. 1-514, -1, -3, -4, -5, -6, 1-520-0, -1, -3, -4, -7, -8)

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MODEL 325M

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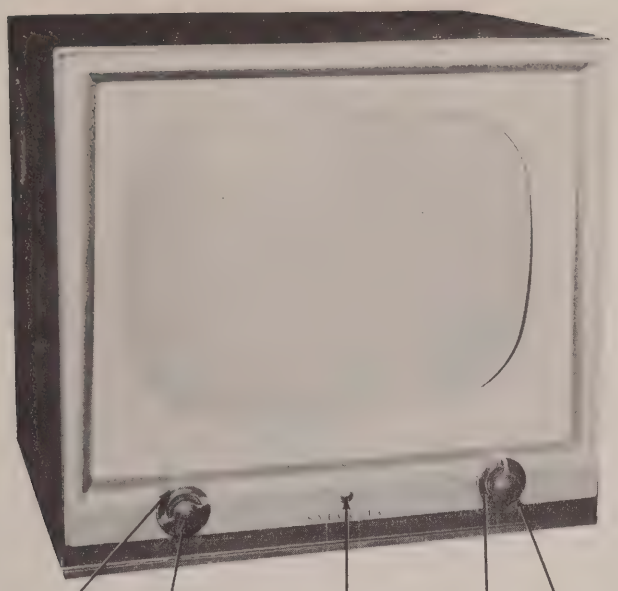

SYLVANIA MODEL 325 SERIES (Ch. 1-520-1)

TRADE NAME	Sylvania	MODELS	CHASSIS
		105-14, 300 Series	1-514-1, -3
		306 Series	1-514-3
		105-14U, 300U, 306U Series	1-514-4
		301 Series	1-514-5
		301U Series	1-514-6
		120-20, 320, 325 Series	1-520-1, -3
		326 Series	1-520-0, -7
		120-20U, 325U Series	1-520-4
		326U Series	1-520-8
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & Television Div., 254 Rano St., Buffalo, N.Y.		
TYPE SET	Television Receiver		
TUBES	Twenty-two		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 1.72 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF , Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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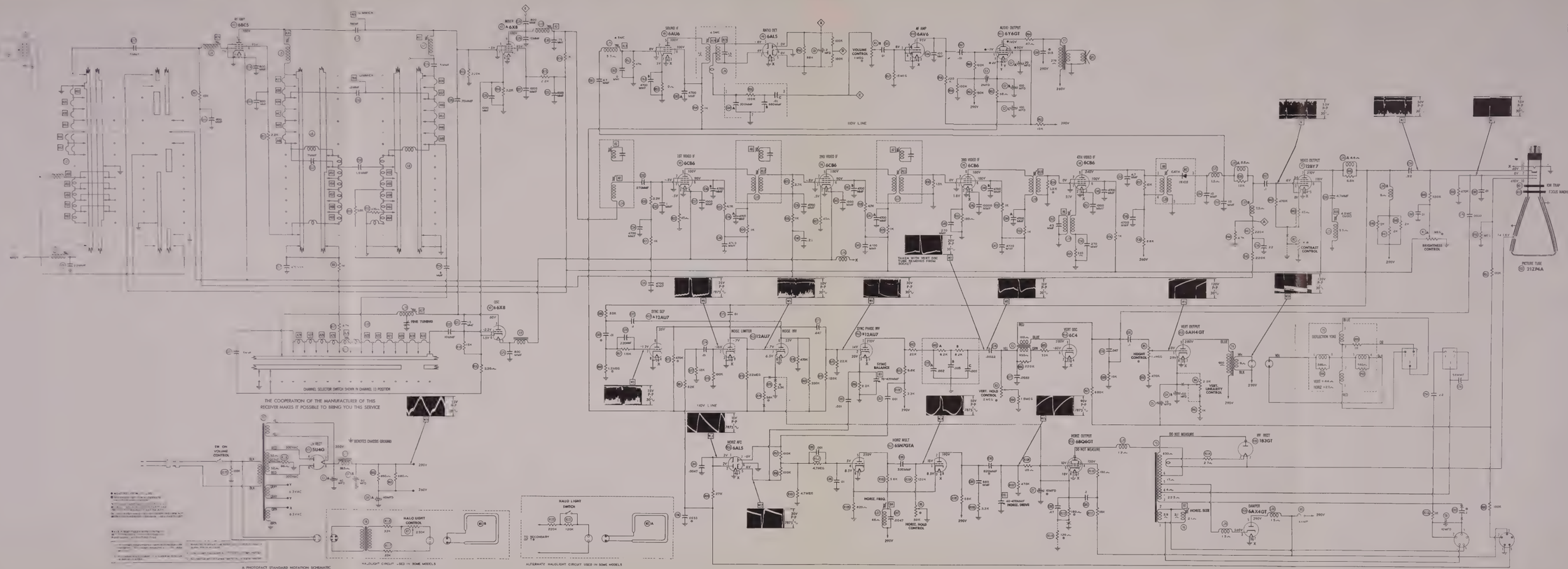

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SYLVANIA MODELS SERIES 105-14, 105-14U, 120-20, 120-20U, 300, 300U, 301, 301U, 306, 306U, 320, 325, 325U, 326, 326U (Ch. 1-514, -1, -3, -4, -5, -6, 1-520-0, -1, -3, -4, -7, -8)

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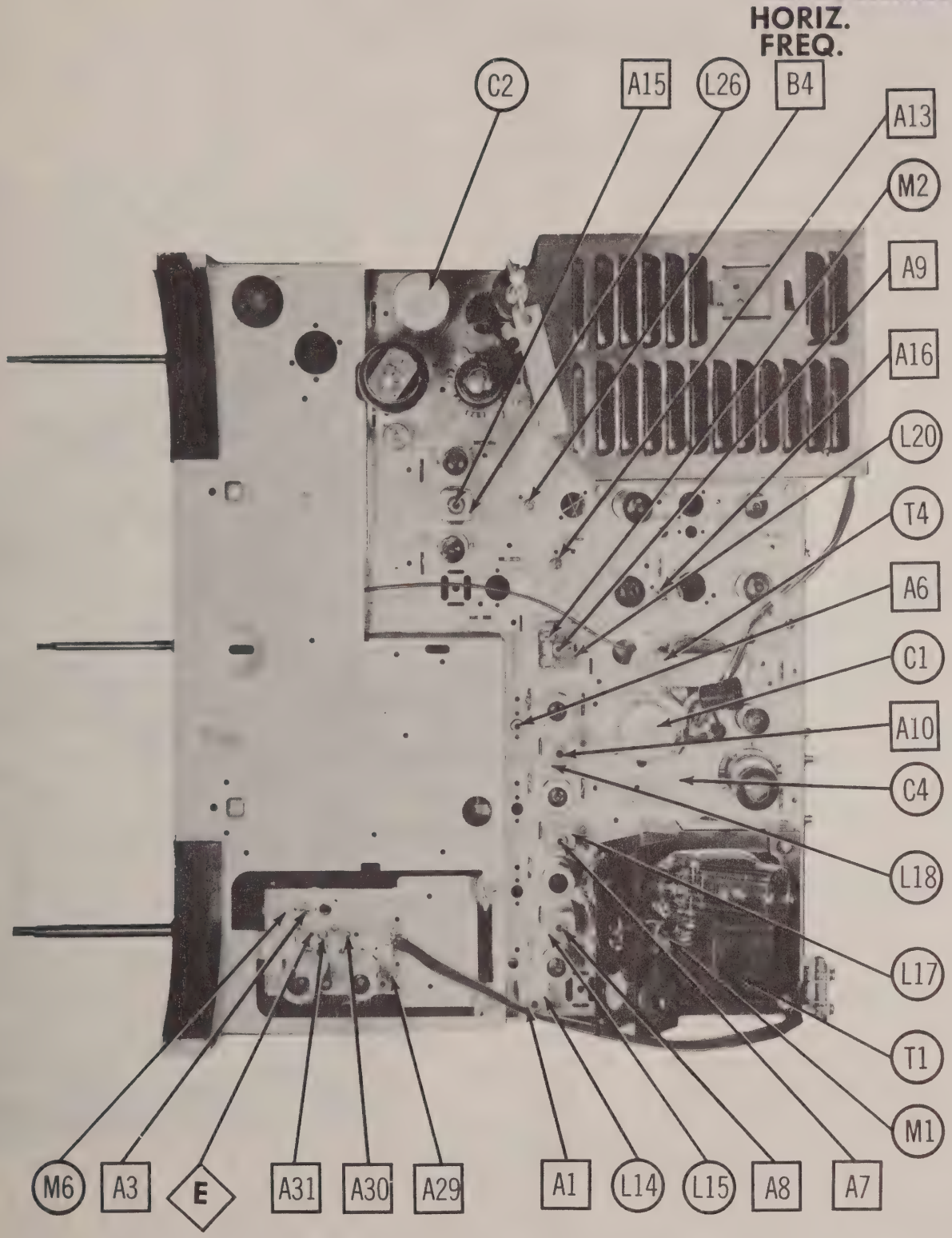

For tube location see tube placement chart page 10.

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CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube V17.
Allow 15 minute warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Set Fringe (AGC) switch fully counter clockwise on 1-514-3, 1-514-4, 1-520-3, 1-520-4 and 1-520-8 chassis.
Connect the negative lead of a 3 volt battery to the ungrounded side of C40. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Where it is necessary to distinguish between two types of chassis due to alignment differences they will be indicated by a dagger (†) and asterisk (*) as follows:
Chassis 1-514-1, 1-520-1 and 1-520-7 (*)
Chassis 1-514-3, 1-514-4, 1-520-3, 1-520-4 and 1-520-8 (†)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	Not used	39.75MC (Unmod.)	Any non-interfering channel	Use VTVM. DC probe to point (A). Common to chassis.	A1	Adjust for MINIMUM deflection. Lower converter tube shield to normal position.
2.		(*) High side coupled loosely to point (E). Low side to chassis. (†) High side coupled loosely to pin 5 (grid) of 6J6 (osc. mixer). Low side to chassis.	43.25MC (10MC Swp)	42.1MC 45.75MC	(*) Set to any unused high channel. (†) Set tuner between any two channels.	Vert. Amp. thru detector (Fig.1) to pin 5 (plate) of 6CB6 (V3). Common to chassis.	A2, A3, A4, A5	Remove 3 volt bias battery. Disconnect primary of L15 from pin 5 of V3 and connect a 330Ω resistor from pin 5 to B+ end of L15. Adjust for response similar to Fig. 2. (*) A2 and A3 positions 45.75MC marker. (†) A4 positions 42.1MC marker. A5 and A2 positions 45.75MC marker. Repeat adjustments until response is flat topped with 42.1MC and 45.75MC markers positioned as shown in Fig.2. Remove 330Ω resistor and restore connection to primary of L15.
3.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	Not used	41.25MC (Unmod)	Any non-interfering channel	Use VTVM. DC probe to point (A). Common to chassis.	A6	Adjust for MINIMUM deflection.
4.	"	"	"	47.25MC	"	"	A7	"
5.	"	"	"	41.25MC	"	"	A8	"
6.	"	"	"	44.0MC	"	"	A9	Adjust for maximum deflection. Attenuate generator to maintain 1 to 2 volts at VTVM.
7.	"	"	"	42.0MC	"	"	A10	"
8.	"	"	"	45.2MC	"	"	A11	"
9.	"	"	"	43.2 MC	"	"	A12	Adjust for maximum deflection. Attenuate generator to maintain 1 to 2 volts at VTVM. Repeat steps 3 thru 9.
10.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	43.25MC (10MC Swp)	41.25MC 42.1MC 45.0MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 33KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig.3. If necessary retouch A9 thru A12 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1 %) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC Probe to point (B). Common to chassis.	A13, A14	Adjust for maximum deflection.
12.	"	"	"	"	DC Probe to point (C). Common to point (D).	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel	Vert. Amp. to point (B). Low side to chassis.	A13, A14	Disconnect stabilizer capacitor C8. Adjust for curve of maximum amplitude and symmetry as in Fig. 4.
12.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A15	Reconnect stabilizer capacitor C8. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 5. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

ALTERNATE SOUND IF ALIGNMENT

If a 4.5MC signal of crystal accuracy is not available the sound IF strip may be aligned by tuning in a strong TV station. Connect the VTVM and adjust A13, A14 and A15 as outlined in steps 11 and 12 under "Sound IF Alignmnet Using AM Signal Generator and VTVM".

4.5MC TRAP ALIGNMENT

Short pin 1 (grid) of 6CB6 (V6) to chassis during alignment.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	.001MFD	High side to Pin 2 (grid) of 12BY7 (V7). Low side to chassis.	4.5MC (Unmod)	Any	DC Probe thru detector (Fig. 1) to Pin 11 of picture tube. Common to chassis.	A16	Adjust for MINIMUM deflection.

VHF TUNER ALIGNMENT FOR CHASSIS 1-514-1; 1-520-1; 1-520-7

Connect 3 volt bias battery as under video IF alignment. Disconnect the primary winding of L15 from Pin 5 (plate of 6CB6(V3) and connect a 330Ω resistor from the B+ end of L15 to Pin 5 of V3.
During alignment the use of two marker generators is required. Generator #1 (LF) is connected through a 2 or 3 MMF capacitor to the input of detector probe (see Fig. 6). Marker generator # 2 (RF) is connected through a 2 or 3 MMF capacitor across the sweep generator at the antenna terminals. If the sweep generator has a built-in marker generator, it should be used for marker generator #2.
Since it is necessary during the tuner alignment to switch the oscilloscope vertical input between the IF detector circuit (Fig. 7), which is connected to Pin 5 of V3, and the RF detector circuit (Fig. 6), which is connected to alignment point (P) on tuner, it is recommended that a single pole double throw switch be mounted as closely as possible to the oscilloscope vertical input terminals so the vertical input terminals may be easily switched between the RF and IFdetector circuits. All connecting leads should be shielded and kept as short as possible.
Set the fine tuning control so the plates are approximately half meshed.
Remove 6CB6 (V4) from its socket.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

VHF TUNER OSCILLATOR ALIGNMENT

Since channels 2 to 5 and 7 to 12 are aligned by expanding or compressing coil increments, the preceeding aligned increments must not be disturbed.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC (RF marker) 45.75MC (IF marker)	13	Vert. Amp. thru detector (Fig. 6) to IF marker gen. and point (P). Low side to chassis.	A17	Adjust so that RF and IF markers coincide as in Fig. 8.
15.	"	"	207MC (10MC Swp)	205.25MC 45.75MC	12	"	A16	Expand or compress coil until markers coincide as in Fig. 8. Curves may not be symmetrical until RF alignment is complete.
16.	"	"	201MC (10MC Swp)	199.25MC 45.75MC	11	"	A19	"
17.	"	"	195MC (10MC Swp)	193.25MC 45.75MC	10	"	A20	"
18.	"	"	189MC (10MCSwp)	187.25MC 45.75MC	9	"	A21	"
19.	"	"	183MC (10MC Swp)	181.25MC 45.75MC	8	"	A22	"
20.	"	"	177MC (10MC Swp)	175.25MC 45.75MC	7	"	A23	"
21.	"	"	85MC (10MC Swp)	83.25MC 45.75MC	6	"	A24	Adjust so that RF and IF markers coincide as in Fig. 8.
22.	"	"	79MC (10MC Swp)	77.25MC 45.75MC	5	"	A25	Compress or expand coils until markers coincide as in Fig. 8.
23.	"	"	69MC (10MC Swp)	67.25MC 45.75MC	4	"	A26	"
24.	"	"	63MC (10MC Swp)	61.25MC 45.75MC	3	"	A27	"
25.	"	"	57MC (10MC Swp)	55.25MC 45.75MC	2	"	A28	"

VHF TUNER RF ALIGNMENT

Care must be exercised not to disturb the preceeding aligned coil increments.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
26.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru detector (Fig. 6) to IF marker gen. and point (P). Low side to chassis.	A29, A30 A31	Adjust A29 for maximum mid-band height regardless of skirts. Adjust A30 for proper skirt contour. Adjust A31 for flat topped response. See Fig. 9. Video carrier must be 100%. Sound carrier may be as low as 70%.
27.	"	"	"	45.75MC 42.1MC	"	Vert. amp. thru detector (Fig. 7) to Pin 5 of V3. Low side to chassis.	A2, A3	Adjust for response curve similar to Fig. 10.
28.	"	"	"	211.25MC 215.75MC	"	Vert. amp. thru detector (Fig. 6) to IF marker gen. and point (P). Low side to chassis.		If necessary, SLIGHTLY retouch A31 for flat top. There must not be more than 5% dip in response curve. See Fig. 11.
29.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"	A32,A33 A34	Compress or expand coils for channel 12 to obtain response similar to Fig. 12. A32 adjust mid-band amplitude, A33 adjusts skirt frequency, A34 adjusts for flat tapped response.
30.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	11	"	A35, A36 A37	Compress or expand coil for curve similar to to Fig. 12. Picture and sound markers must remain on top of curve.
31.	"	"	195MC (10MC Swp)	193.25MC 197.75MC	10	"	A38,A39 A40	"
32.	"	"	189MC (10MC Swp)	187.25MC 191.75MC	9	"	A41, A42 A43	"
33.	"	"	183MC (10MC Swp)	181.25MC 185.75MC	8	"	A44, A45 A46	"
34.	"	"	177 MC (10MC Swp)	175.25MC 179.75MC	7	"	A47,A48, A49	"
35.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A50, A51, A52	"
36.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A53, A54 A55	"

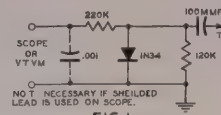


FIG.1

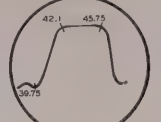


FIG.2

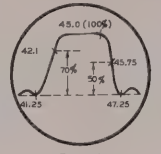


FIG.3

FIG.4

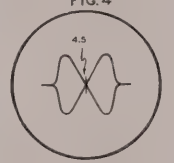


FIG.5

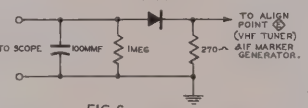


FIG.6

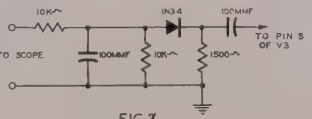


FIG.7

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
37.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	69MC (10MC Swp)	67.25MC 71.75MC	4	Vert. amp. thru detector (Fig. 6) to IF marker gen. and point (P). Low side to chassis.	A56, A57, A58	Compress or expand coils for curve similar to Fig.12. Picture and sound markers must remain on top of curve.
38.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A59,A60, A61	"
39.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A62, A63, A64	"
40.	Recheck all channels for flat topped response. If necessary, retouch A30 through A64 in order given. A dip of 30% is permissable for all channels If the bandwidth of any channel is insufficient after foregoing adjustments, adjust "gimmicks" A65 and A66 by bending wires toward or away from capacitors C15 and C16. Remove 330Ω resistor from plate of V3 to B+. Restore connection to L15. Replace V4 in its socket. Remove test equipment. Continue alignment (UHF tuner) with step 50.							

VHF TUNER ALIGNMENT FOR CHASSIS 1-514-3, 1-514-4; 1-520-3; 1-520-4; 1-520-8

Connect the negative lead of a 2. 5 volt bias supply to the tuner AGC terminal.
Disconnect the primary winding of L15 from Pin 5 (plate) of 6CB6 (V3) and connect a 330Ω resistor from the B+ end of L15 to Pin 5 of V3.
During alignment the use of two marker generators is required. Generator #1 (LF) is connected through a . 001MFD to .005MFD capacitor to Pin 2 (cathode) of 6CB6 (V3). Marker generator # 2 (RF) is connected through a 2 or 3 MMF capacitor across the sweep generator at the antenna terminals. If the sweep generator has a built-in marker generator, it should be used for marker generator # 2.
Since it is necessary during the tuner alignment to switch the oscilloscope vertical input between the IF detector circuit (Fig. 7) which is connected to Pin 5 of V3 and looker point (P) through a 10KΩ resistor, it is recommended that a single pole double throw switch be mounted as closely as possible to the oscilloscope vertical input terminals so the vertical input terminals may be easily switched beween looker point (P) and IF detector circuits. All connecting leads should be shielded and kept as short as possible.
Remove 6CB6 (V4) from its socket.
The vacillator adjustment screws are reached through a hole to the upper right of the channel switch shaft.
The correct adjustment screw is accesible through this hole as the channel switch is turned to each channel.
To adjust A70, A71, A72 and A73 the side cover of the tuner must be removed. Loosen the side cover screws and slide the cover out between chassis and tuner. Adjustments may then be made through hole in chassis opposite tuner. Replace cover after completing adjustments.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
41.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead. Connect 300Ω resistor across antenna terminals.	69MC (10MC Swp)	67.25MC 71.75MC	4	Vert. Amp. thru 10KΩ to point (P). Low side to chassis	A67, A68, A69, A70	Adjust for response similar to Fig .13. A70 is a wire loop and affects band width. Video marker should be on inside of response curve.
42.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"	A70, A71, A72	If proper band width cannot be obtained by adjustment of A70 it may be necessary to adjust A71 and A72 by positioning the capacitors so as to move them SLIGHTLY farther apart. Adjust the interstage band width, so that proper overall band width occurs with antenna circuit aligned.
43.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A69	Adjust for symmetrical response. See Fig. 13 for permissable variations.
44.	Direct	High side thru hole in tuner cover to pin 5 (grid) of 6J6 (osc. mixer)	43.25MC (10MC Swp)	42.1MC 45.75MC	Set tuner between any two channels	Vert. Amp. thru detector (Fig.7) to pin 5 of V3. Low side to chassis.	A5, A4, A3	Adjust for response similar to Fig.14. A5 and A3 affects position of 45.75MC marker. A4 determines band width or position of 42.1MC marker.
45.	Two 120Ω Carbon Resistors	Same as step 41.	69MC (10MC Swp)	67.25MC (RF marker) 45.75MC (IF marker)	4	"	A74	Adjust to make 67.25MC marker coincide with 45.75MC marker on response curve. If necessary adjust A77 to bring marker within proper tuning range of A74.
46.	Two 120Ω Carbon Resistors	Same as step 41.	57MC (10MC Swp)	55.25MC 59.75MC	2	Vert. Amp. thru detector (Fig.7) to pin 5 of V3. Low side to chassis.	A75	Adjust to make video RF marker and 45.75MC . IF marker coincide on response curve (See Fig.2). 42.1MC IF marker should appear as shown in Fig.2 . Check RF band pass on each channel for response similar to Fig. 13 . If necessary SLIGHTLY retouch A68, A69, A70 and A74 for best compromise on all channels.
			63MC (10MC Swp)	61.25MC 65.75MC	3		A76	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A77	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A78	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A79	
47.	"	"	183MC (10MC Swp)	181.25MC 185.75MC	7	"	A80	Same as step 46. Also If one or more coil strips cannot be made to track properly without peaking coils to correct pass bands, replace strips. If a deep valley occurs adjust A73 by compressing or expanding coil turns. If conditions remain uncorrected replace the 6J6 osc.-mixer tube. If 6J6 is replaced, repeat steps 41 thru 45.
			189MC (10MC Swp)	187.25MC 191.75MC	8		A81	
			195MC (10MC Swp)	193.25MC 197.75MC	9		A82	
48.	"	"	195MC (10MC Swp)	193.25MC 197.75MC	10	"	A83	Same as step 46.
			201MC (10MC Swp)	199.25MC 203.75MC	11		A84	
			207MC (10MC Swp)	205.25MC 209.75MC	12		A85	
49.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"	A86	Same as step 46. Also, if too deep a valley occurs on response. Readjust A73 by compressing or expanding coil turns.

UHF TUNER ALIGNMENT CHASSIS 1-514-4; 1-520-4; 1-520-8

Video band pass should be checked before attempting UHF alignment. Refer to step 2 and Fig. 2.
Switch VHF tuner to the UHF position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

UHF TUNER OUTPUT CIRCUIT ALIGNMENT

Connect the negative lead of a 2. 5 volt bias supply to the VHF tuner AGC terminal.
Disconnect the primary winding of L15 from Pin 5 (plate) of 6CB6 (V3) and connect a 330Ω resistor from the B+ end of L15 to Pin 5 of V3.
Connect IF and RF marker generators and scope as outlined under VHF TUNER ALIGNMENT for chassis 1-514-3; 1-514-4; 1-520-3; 1-520-4; 1-520-8.

ALIGNMENT INSTRUCTIONS (cont)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
50.	Direct	High side to test point ◇G◇. Low side to chassis.	43.25MC (10MC Swp)	42.1MC 45.75MC	UHF	Vert. Amp. thru detector (Fig. 7) to pin 5 of V3. Low side to chassis	A87	Adjust for response similar to Fig. 2.

UHF TUNER PRESELECTOR ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
51.	See Fig. 15	Thru matching pad (Fig. 15) to UHF antenna terminals.	473MC thru 887MC (10MC Swp)	42.1MC 45.75MC	14 thru 83	Vert. Amp. thru detector (Fig. 7) to pin 5 of V3. Low side to chassis.	A88, A89, A90	Turn tuner and sweep generator simultaneously thru the UHF tuning range and observe response curve which should be similar to Fig. 16. Adjust A88, A89 and A90 for best compromise on dip and tilt. Additional adjustment can be made by bending rotor plates SLIGHTLY. DO NOT readjust A2, A4 or A5 to remove excessive tilt in overall response curve. Disconnect test equipment. Remove 330Ω resistor from pin 5 of V3 and restore connection to L15. Replace V4 in its socket.

UHF OSCILLATOR ADJUSTMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
52.	See Fig. 15	Thru matching pad (Fig. 15) to UHF antenna. UHF antenna terminals.	Not used	890MC (Unmod)	83 (UHF tuning cap. plates fully open.)	Use VTVM. DC probe to point ◇A◇. Common to chassis.	A91	Adjust for maximum deflection.

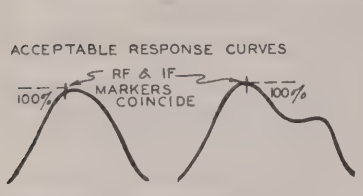


FIG. 8

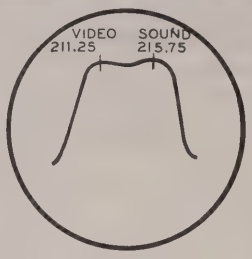


FIG. 9

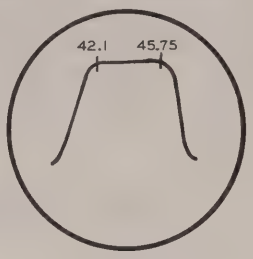


FIG. 10

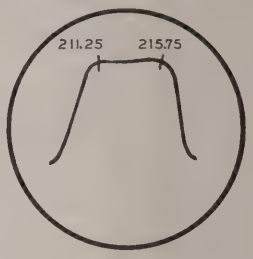


FIG. 11

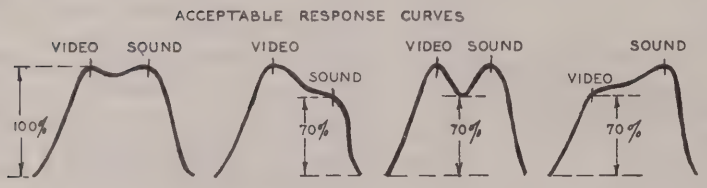


FIG. 12

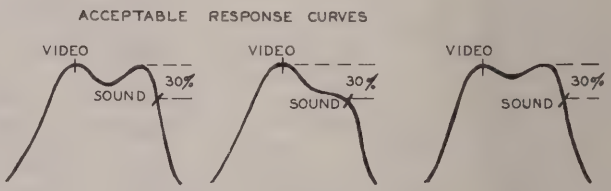


FIG. 13

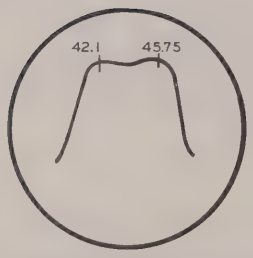


FIG. 14

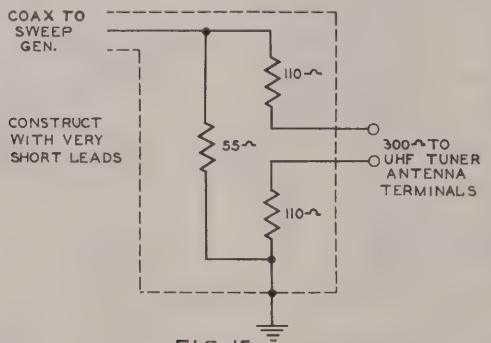


FIG. 15

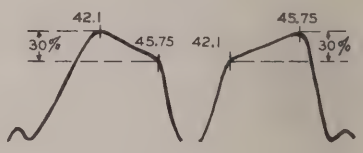
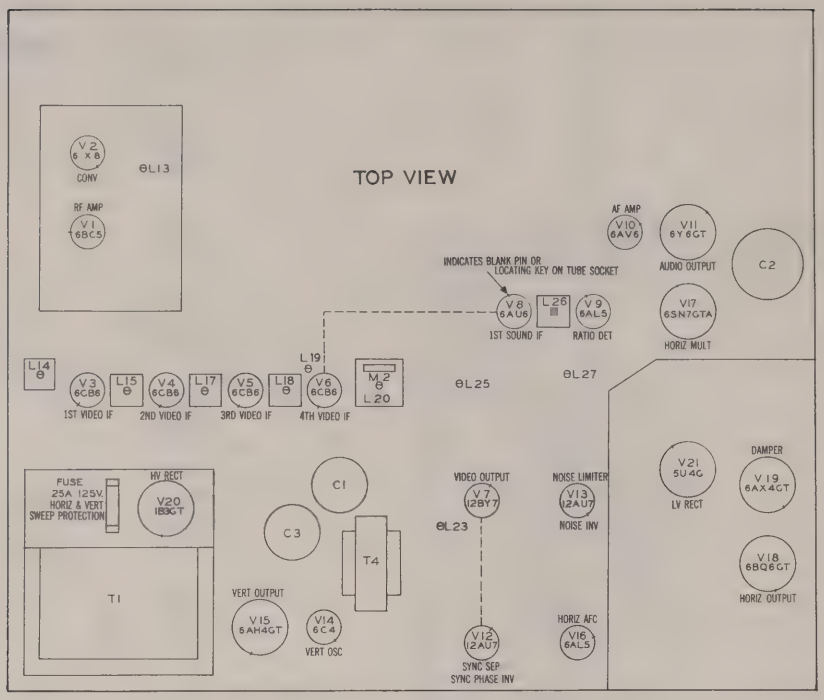


FIG. 16

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V21

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster -V2, V3, V4, V5, V6, V11
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster -V7, V22
Has pic, no sound - V8, V9, V10, V11

SYNC FAILURE
No vert. sync - V12, V14
No horiz. sync - V12, V16, V17
No vert. or horiz. sync - V12, V13

SWEEP FAILURE
No raster, has sound -V17, V18, V19, V20, V22, Fuse (M1)
No vertical deflection - V14, V15
Poor vert. linearity or foldover - V14, V15
Poor horiz. linearity or foldover - V17, V18, V19
Narrow picture - V17, V18, V19, V20, V21
Vert. off freq. - V12, V14
Horiz. off freq. - V12, V16, V17

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	460KΩ	0Ω	.1Ω	0Ω	† 1KΩ	† 3. 2KΩ	0Ω		
V 2	6X8	0Ω	15KΩ	† 4. 7KΩ	0Ω	.1Ω	15KΩ	220KΩ	† 2. 2KΩ	† 1KΩ
V 3	6CB6	445KΩ	47Ω	0Ω	.1Ω	† 1KΩ	† 4. 7KΩ	0Ω		
V 4	6CB6	441KΩ	47Ω	.1Ω	0Ω	† 1KΩ	† 4. 7KΩ	0Ω		
V 5	6CB6	.1Ω	180Ω	0Ω	.1Ω	† 1KΩ	† 1KΩ	0Ω		
V 6	6CB6	.1Ω	330Ω	.1Ω	0Ω	# 6. 8KΩ	† 1KΩ	0Ω		
V 7	12BY7	350Ω	470KΩ	350Ω	.1Ω	.1Ω	0Ω	# 4KΩ	† 0Ω	350Ω
V 8	6AU6	47KΩ	0Ω	.1Ω	0Ω	† 1KΩ	† 1KΩ	100Ω		
V 9	6AL5	INF	INF	.1Ω	0Ω	0Ω	0Ω	68KΩ		
V 10	6AV6	15 Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	# 230KΩ		
V 11	6Y6G	# 180KΩ	† 68Ω	# 1KΩ	# 10KΩ	# 250KΩ	# 1KΩ	† 68Ω	† 68Ω	
V 12	12AU7	# 10KΩ	22KΩ	2. 2KΩ	.1Ω	.1Ω	† 170KΩ	1. 7Meg	0Ω	0Ω
V 13	12AU7	† 22Meg	100KΩ	0Ω	0Ω	0Ω	† 280KΩ	† 22Meg	3. 3KΩ	.1Ω
V 14	6C4	♦ 780KΩ	INF	0Ω	.1Ω	INF	2. 5Meg	0Ω		
V 15	6AH4GT	1. 6Meg	0Ω	INF	♦ 280KΩ	# 1KΩ	♦ 100KΩ	.1Ω	2KΩ	
V 16	6AL5	27KΩ	27KΩ	.1Ω	0Ω	4. 8Meg	0Ω	4. 8Meg		
V 17	6SN7GT	150KΩ	# 68KΩ	820Ω	9. 4Meg	# 5. 6KΩ	820Ω	0Ω	.1Ω	
V 18	6BQ6GT	INF	.1Ω	180Ω	# 18KΩ	470KΩ	# 18KΩ	0Ω	180Ω	TOP CAP ♦ 20Ω
V 19	6AX4GT	INF	INF	800KΩ	INF	# 40Ω	♦ 1. 5Ω	.1Ω	0Ω	
V 20	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								TOP CAP ♦ 650Ω
V 21	5U4G	INF	100KΩ	INF	100Ω	INF	100Ω	INF	100KΩ	
V 22	21ZP4A	0Ω	470KΩ	PIN 10 ♦ 280KΩ	PIN 11 † 500KΩ	PIN 12 .1Ω				

♦ MEASURED FROM PIN 3 OF V19.
† MEASURED FROM 110 VOLT LINE.
# MEASURED FROM PIN 8 OF V21.

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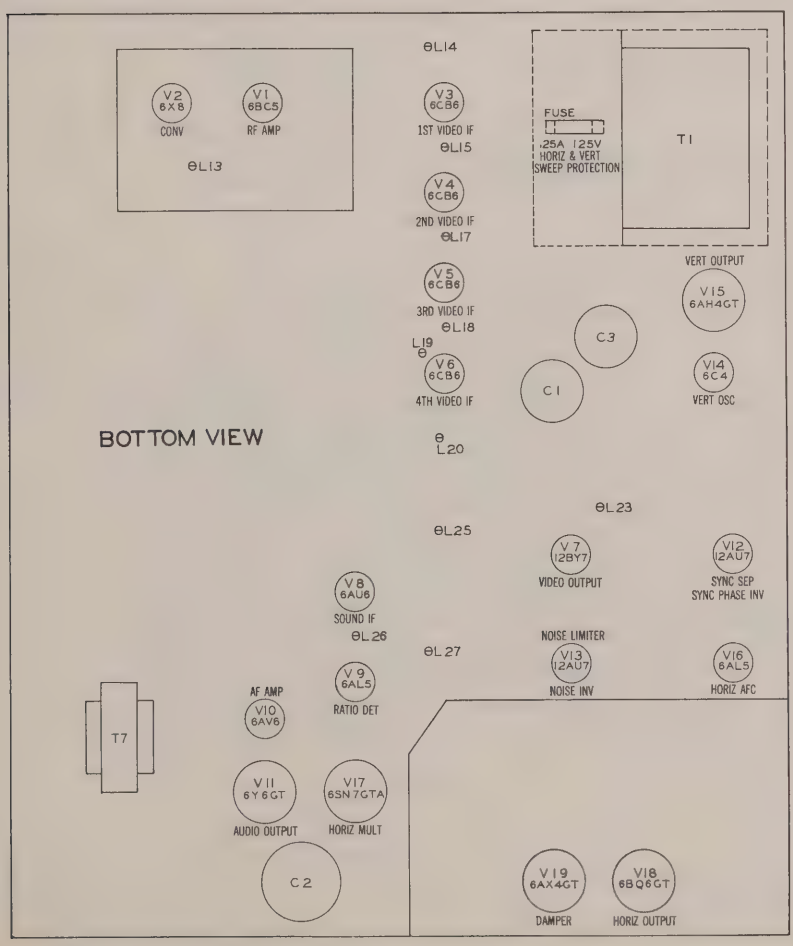
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO



TUBE PLACEMENT CHART

SET 234 FOLDER 13

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V17, V18, V19 and V21. Check adjustments B1 and B2. Check waveform W15.

If Satisfactory	If Unsatisfactory
Check C91, C93, C94, R111, T3, T5A and other associated components.	Check C88, C89, C90, R105, R107, R109 and other associated circuit components.

DRIVE LINES

Check by substitution V17, V18 and V19. Check adjustment B1. Check T3, T5A, C89, C90, C91, C93, C94, R107, R105, R106 and other associated circuit components for failure or change of value.

COMPRESSED LEFT SIDE

Check by substitution V17, V18 and V19. Check adjustment B1 and B2. Check T3, T5A and other components associated with the horizontal output and damper circuit components.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Substitute V18 and V19. Check associated components. Check C86 for open.

XMAS TREE EFFECT

Substitute V17. Check C87, C88, L27 and other associated components for failure or change of value.

VERTICAL

LOSS OF SWEEP

Check by substitution V14 and V15. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check T4, T5B and other associated components.	Check C81, T2, R5, R90 and other associated components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Follow procedure outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V14 and V15. Check T4, T5B, C4B and other associated components.

COMPRESSED AT TOP

Check by substitution V14 and V15. Check T2, C81, R5 and other associated circuit components.

FOLDS

Check by substitution V14 and V15. Check associated circuit components for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Substitute V12 and V13. Check associated circuit components for failure or change of value.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V12, V13 and V14. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check components associated with V14.	Check vertical integrator network and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Substitute V16 and V17. Check adjustments B3 and B4. Check components associated with V16 and V17.

HORIZONTAL BENDING

Check by substitution V16, V17 and V18. Check Horizontal AFC Filter network components (C85, C86, R101, R102) for failure or change of value.

VIDEO

LOSS OF VIDEO

Substitute V7. Check picture tube and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best picture and sound. Check 4.5MC trap adjustment A16. Check video IF alignment.

POOR CONTRAST

Substitute V7. Check video detector assembly. Check picture tube and other associated circuit components.

NEGATIVE PIX

Substitute V7. Check video detector assembly. Check AGC network for component failure. Check picture tube.

SMEAR

Substitute V7. Check video detector crystal and assembly. Check C57, C59, L24A, R46, R47, R48, R49, R42, picture tube and other associated circuit components for failure or change of value.

WIDE BLACK BAR ACROSS PIX

Check V1, V2, V3, V4, V5, V6 and V7 for heater to cathode leakage. Check B+ filter capacitors for open.

AUDIO

WEAK OR NO SOUND

Check by substitution V8, V9, V10 and V11. Check stages V10 and V11 using audio signal generator. Apply audio signal across R57.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V10 and V11.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A15 for minimum buzz. If still objectionable, substitute V9 and realign audio IF and ratio detector stages.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1. If filaments light, substitute V21. Check R116, C1A, C1B and other B+ filter and decoupling network components.

SMALL AND/OR DIM PIX

Substitute V21. Check B+ filter and decoupling components.

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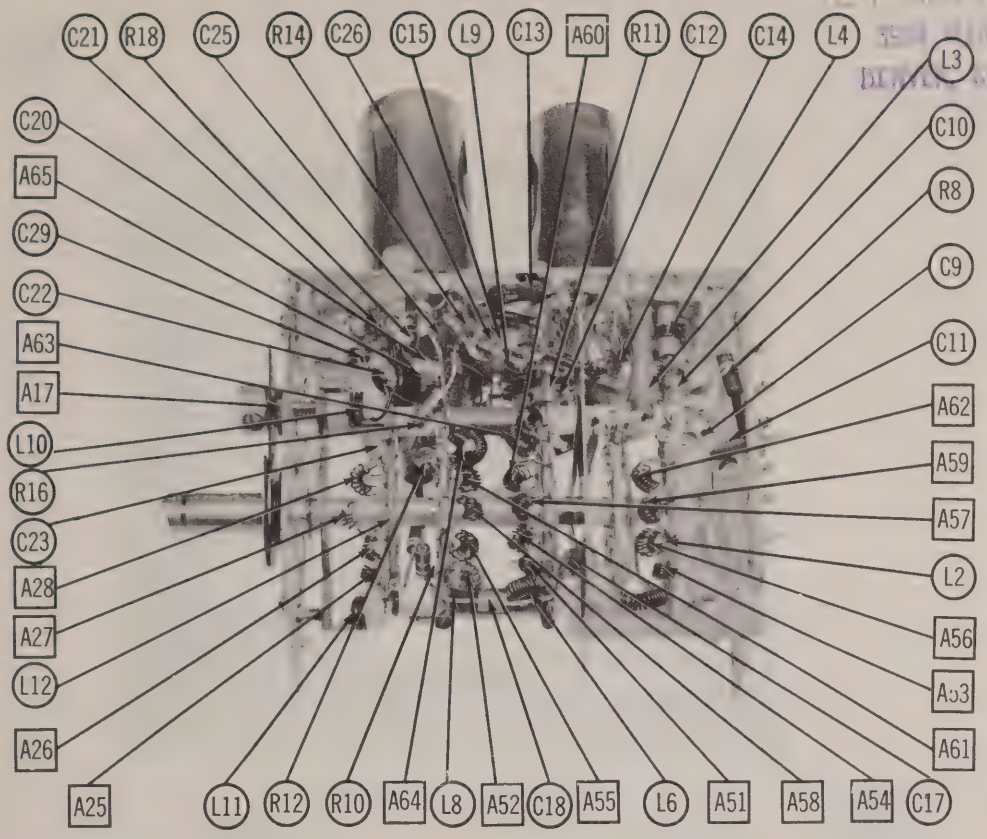
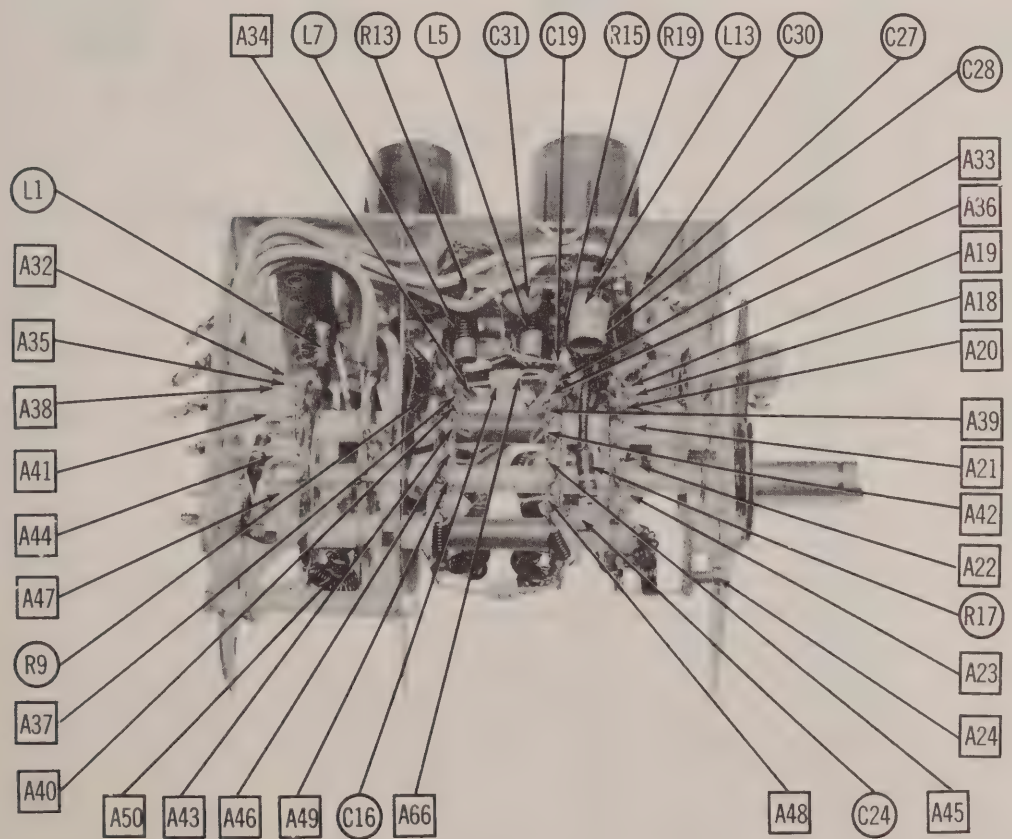
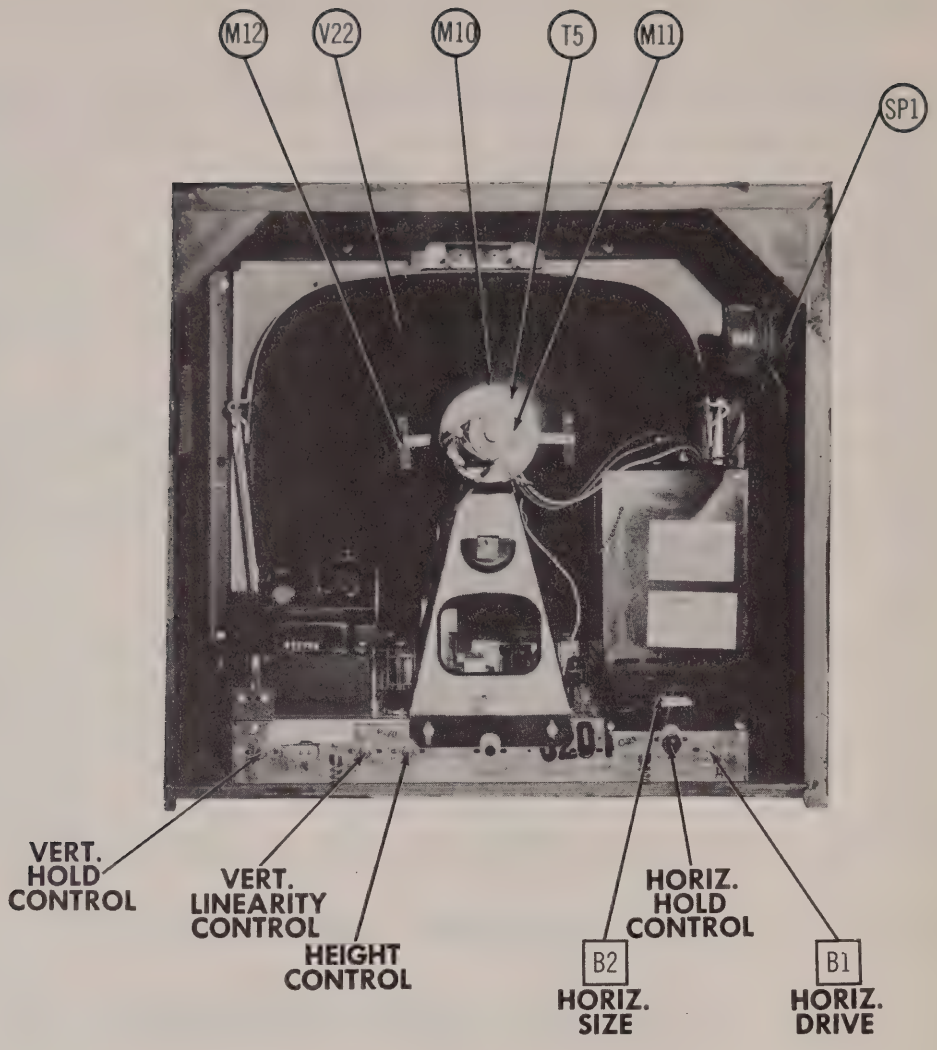
L. F. RADIOSHIP
DENVER, COLORADO



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal drive trimmer (B1) counter clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.

Adjust the horizontal size slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

To adjust the horizontal AFC circuit proceed as follows:

1. Short pin 2 (cathode) of 6AL5 (V16) to chassis.
2. Connect DC probe of VTVM to pin 4 (grid) of 6SN7GT/A (V17). Common to chassis.
3. Adjust "sync balancing" trimmer (B3) for MINIMUM deflection on VTVM. Remove VTVM.
4. Set horizontal hold control to its mid-range position and adjust horizontal frequency slug, (B4), until picture moves back and forth across screen with blanking bar in a vertical position.
5. Remove short from pin 2 of V16.
6. Set contrast control fully counter clockwise and turn horizontal hold control for best picture lock-in action.
7. Set contrast control for normal contrast and check for proper lock-in on all available channels. If necessary, slightly readjust the horizontal hold control.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

PROPERTY OF
L. F. [illegible]
3924 [illegible]
DENVER, COLORADO

ITEM No.	USE	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BC5	6BC5	7BD	
V2	Converter	6X8	6X8	9AK	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Output	12BY7	12BY7	9BF	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AF Amplifier	6AV6	6AV6	7BT	
V11	Audio Output	6Y6GT	6Y6GT	7S	
V12	Sync Separator-Sync Phase Inverter	12AU7	12AU7	9A	
V13	Noise Limiter-Noise Inverter	12AU7	12AU7	9A	
V14	Vert. Oscillator	6C4	6C4	6BG	
V15	Vert. Output	6AH4GT	6AH4GT	8EL	
V16	Horiz. AFC	6AL5	6AL5	6BT	
V17	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V18	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V19	Damper	6AX4GT	6AX4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SYLVANIA PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V22A	21ZP4	21ZP4 21ZP4B 21ZP4A ① 21AFP4 ① 21YP4 ①	21ZP4 21ZP4B	21ZP4	12N 12N	① Circuit changes necessary.
B	17YP4				12N	
C	17JP4	17JP4			12N	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	400	161-2004	AFH2-64		C035		FP377	TVL-2675	
B	▲80	400								
C2A	▲20	350	161-3017	AFH4-42		XB010		FP432.9	TVL-4604	
B	■100	200		PRS450/20		BR2035		TC59		
C	▲100	200								
C3	2	50	161-1001	PRS150/4		BBR2-50T		TC302	TVA-1301	
C4A	▲40	400	161-2005	AFH3-140		C104		FP229.6	TVL-2653	
B	▲100	50								
C5	10	500	161-1010	PRS500/10		BR1050		TC82	TVA-1902	
C6	10	350	161-1012	PRS350/10		BR1045		TC62	TVA-1604	
C7	10	350	161-1012	PRS350/10		BR1045		TC62	TVA-1604	Note 1
C8	2	50	161-1001	PRS150/4		BBR2-50T		TC302	TVA-1301	
C9	22			SI22NP0	TCZ-22		NP0K-220	ZT-5422	5TCC-Q22	
C10	15			SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C11	800			BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	
C12	470			SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C13	800			BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	
C14	800			BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	
C15	.3									
C16	.3									
C17	.7									
C18	1.6									
C19	15			SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C20	.75									
C21	1.5									
C22	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C23	1.5									
C24	1.6									
C25	800			BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	
C26	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C27	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C28	800			BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	
C29	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C30	75									
C31	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C32	270		166-0270N	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C33	1		166-0001P							
C34	4700		166-4700D	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C35	4700		166-4700D	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C36A	4700		168-0011D	BPD-2X0047	DD2-502	TM5DD5	811-005	DCD-525	5HK-2D47	
B	4700						811-005			
C37	1000		166-1000D	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C38	4700		166-4700D	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C39	4700		166-4700D	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C40	.22	200	162-0202	P488-22		PTE4P22		PT4025	4TM-P22	
C41A	4700		168-0011D	BPD-2X0047	DD2-502	TM5DD5	811-005	DCD-525	5HK-2D47	
B	4700						811-005			
C42	1000		166-1000D	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C43	4700		166-4700D	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C44A	4700		168-0011D	BPD-2X0047	DD2-502	TM5DD5	811-005	DC-525	5HK-2D47	
B	4700						811-005			
C45	270		166-0270N	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C46	1000		166-1000D	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C47	4700		166-4700D	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C48	4700		166-4700D	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	
C49	4700		166-4700D	BPD-0047	DD-502	TM5D5	811-005	DC-525	5HK-D47	

(CONT'D ON NEXT PAGE)

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C50	270		156-0270M	SZ5S	DS-271		GPSK-271	UC-5337	5GA-T27	
C51	1000		156-1000D	B3PD-001	DD-102	TMSD1	SDL-001	DCS-831	5HX-D1	
C52	.43		156-0043P							
C53	4.7		156-0008M	SI4.7NP0	TCZ-4.7		NP0K-4R7	ET-555	5TCCB-V47	
C54	10		156-0010P	SI10NP0	TCZ-10		NP0K-100	ET-541	5TCC-Q1	
C55	10		156-0010P	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C56	.22	200	152-0201	P488-23		PT4P2S		PT4025	4TM-P23	
C57	.1	200	150-0201	P282-1	DF-104	PT2P1		PT401	2TM-P1	
C58	4.7		156-0008M	SI4.7NP0	TCZ-4.7		NP0K-4R7	ET-555	5TCCB-V47	
C59	.22	400	150-0602S	P488-23		PT4P2S		PT4025	4TM-P23	
C60	.01	200	150-0411	P488-01	DS-103	PT4S8I	GP2-333-103	PT411	4TM-S1	
C61	4.7		156-0008M	SI4.7NP0	TCZ-4.7		NP0K-4R7	ET-555	5TCCB-V47	
C62	10		156-0010P	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C63A	4700	}	166-0011D	B3PD-322D047	DD3-502	TMSDD5	SDL-005	DCD-535	5HK-XD47	
B	4700						SDL-005			
C64A	330				DS-331		GP2K-331	UC-5333		
B	680		†191-0013	†PA-123	DS-681		GP2K-681	UC-5386	†10IC6	
C	.01				DD-103		SDL-01	DC-511		
C65	.01	200	150-0411	P488-01	DS-103	PT4S8I	GP2-333-103	PT411	4TM-S1	
C66	500		150-0100	1468-0001	DS-101	SW571	GP2K-101	MC335	1TM-S1	
C67	.01	600	150-0611	P688-01	DS-103	PT4S8I	GP2-333-103	PT611	6TM-S1	
C68	.015	600	150-0615	P688-015						Note 3
C69	.01	400	150-0411	P488-01	DS-103	PT4S8I	GP2-333-103	PT411	4TM-P1	Note 3
C70	220	500	163-0230	1469-00025						
C71	.047	200	150-0417	P288-047	DF-503	PT2S47		PT4747	2TM-S47	
C72	.1	600	150-0601	P688-01	DF-104	PT6P1		PT601	6TM-P1	
C73	.01	600	150-0611	P688-01	DS-103	PT4S8I	GP2-333-103	PT611	6TM-S1	
C74	.01	200	150-0411	P488-01	DS-103	PT4S8I	GP2-333-103	PT411	4TM-S1	
C75A	.002	}				PTE5D2		PTE52		
B	.005		±190-0013	*PA-119	*PC-100	PTE5D5	*1406-01	PT625	*10IC1	
C	.005					PTE5D5		PT625		
C76	.0022	600	162-0223	P688-0022		PTE6D22		PTE623	6TM-D22	
C77	.0033	600	162-0623	P688-0033	DS-332	PTE6D33	GP2-333-332	PTE633	6TM-D33	
C78	.047	600	162-0547	P688-047		PTE5S47		PT6747	6TM-S47	
C79	.0033	600	162-0623	P688-0033	D6-332	PTE6D33	GP2-333-332	PTE633	6TM-D33	
C80	.01	200	150-0411	P488-01	D6-103	PT4S8I	GP2-333-103	PT411	4TM-S1	
C81	.1	400	150-0401	P488-1	DF-104	PT4P1		PT401	4TM-P1	
C82	.001	400	150-0431	P648-001	D6-102	PTE5D1	GP2L-102	PT621	6TM-D1	
C83	.001	400	150-0421	P688-001	D6-102	PTE5D1	GP2L-102	PT621	6TM-D1	
C84	.0047	400	162-0247	P688-0047	D6-472	PTE6D47	GP2-333-472	PTE647	6TM-D47	
C85	.001	200	150-0421	P688-001	D6-102	PTE5D1	GP2L-102	PT621	6TM-D1	
C86	.01	200	150-0411	P488-01	D6-103	PT4S8I	GP2-333-103	PT411	4TM-S1	
C87	.0047	400	162-0247	P688-0047		PTE6D47		PTE647	6TM-D47	
C88	330	500	163-0330	1469-00035						
C89	680	500	163-0680	1479-0007		2R5T7		MH-37		
C90	820	500	163-0820							Note 3
C91	.1	400	150-0401	P488-1	DF-104	PT4P1		PT401	4TM-P1	Note 2
C92	.47	200	163-0247	P288-47		PJ3P5		PT4047	2TM-P47	
C93	.1	600	150-0601	P688-1		PT6P1		PT601	6TM-P1	Note 4
C94	.22	200	150-0425	P488-22		PT4P2S		PT4025	4TM-P23	
C95	56	2000	174-0056						20GA-Q56	
C96	.0033	600	162-0623	P688-0033		PTE6D33		PTE633	6TM-D33	Note 2

Note 1. Not used in all Models. When used, it may be a single unit 10MFD @ 350V (part #181-1012), or part of C2 10MFD @ 100V (a section of part #181-4006).
Note 2. Some Models use .0047MFD in this application (part #160-0624?).
Note 3. Some Models use 1000MMF in this application (part #163-1000).
Note 4. Not used in all Models.
† Items C64A, C64B, C64C, R55 are combined in one unit.
* Items C75A, C75B, C75C, R83A, R83B are combined in one unit. To replace original vertical integrator unit, remove R82 and connect replacement input lead to pin 1 of V12.

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	197-0024	* Q7-513				Brightness - Panel Note 1
B	1Meg	½	Not Reg.					Volume & switch - Rear
R2A	1000Ω	2	153-3013	WK-1000	A43-1000		R100L	Contrast Note 2
B	Shaft		Not Reg.	C-3	KS8-5		D8-36	Attach to R2A
R3A	2Meg	½	153-0018	QU-129	AG-83-8	AB-75	EU-56	Vert. hold Note 3
B	Shaft		Not Reg.	Not Reg.	FK8-1/4	AK-1	Not Reg.	Attach to R3A
R4A	2500Ω	½	153-3011	WK-2500	AG-15-8	AB-7	R2500L	Vert. Linearity
B	Shaft		Not Reg.	Not Reg.	FK8-1/4	AK-1	Not Reg.	Attach to R4A
R5A	1.5Meg	½	153-0014	QU-138	AG-83-8	AB-75	U-155	Height Note 3
B	Shaft		Not Reg.	SQ	FK8-1/4	AK-1	Not Reg.	Attach to R5A
R6A	50KΩ	½	153-0017	QU-123	AG-44-8	AB-31	U-35	Horiz. Hold Note #4
B	Shaft		Not Reg.	Not Reg.	KS8-5	AK-1	Not Reg.	Attach to R6A
R7A	250KΩ	½	153-0015	QU-130	AG-55-8	B-50	U-46	Halo Light Note 5
B	Shaft		Not Reg.	Not Reg.	FS-3	Not Reg.	Not Reg.	Attach to R7A

Note 1. Chassis No. 1-514-1, -3, -4-5-6, may use alternate control Part No. 157-0025.
Chassis No. 1-520-7, -8 may use alternate control Part. No. 157-0026.
Note 2. Chassis No. 1-514-1, -3, -4 may use alternate control Part No. 153-3014.
Chassis No. 1-520-7, -8 may use alternate control Part No. 153-3015.
Chassis No. 1-514-5-6 may use alternate control Part No. 153-3018.
Note 3. Some models may use alternate control Part No. 153-0014.
Note 4. Some models may use alternate control Part NO. 153-0021.
Note 5. Used in models 326 only.
* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS B11-137 & P1-325 (Panel)
B13-137 & R14-414 (Rear) & SWITCH 78-1.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	SYLVANIA PART No.	IRC PART No.	NOTES
R8	15KΩ	½		BTS-15K	
R9	1.000Ω	½		BTS-1000	
R10	3900Ω	½		BTS-3900	
R11	2200Ω	½		BTS-2200	
R12	470Ω	½		BTS-470	
R13	220KΩ	½		BTS-220K	
R14	2200Ω	½		BTS-2200	
R15	2200Ω	½		BTS-2200	
R16	220Ω	½		BTS-220	
R17	4700Ω	½		BTS-4700	
R18	15KΩ	½		BTS-15K	
R19	1000Ω	½		BTS-1000	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	SYLVANIA PART No.	IRC PART No.	NOTES
R20	2200Ω	½	181-0223	BTS-2200	
R21	1000Ω	½	181-0103	BTS-1000	
R22	47Ω	½	181-04705	BTS-47	
R23	4700Ω	½	181-0472	BTS-4700	
R24	1000Ω	½	181-0102	BTS-1000	
R25	2700Ω	½	181-0272	BTS-2700	
R26	1000Ω	½	181-0102	BTS-1000	
R27	47Ω	½	181-04705	BTS-47	
R28	4700Ω	½	181-0472	BTS-4700	
R29	1000Ω	½	181-0102	BTS-1000	
R30	1500Ω	½	181-0152	BTS-1500	
R31	180Ω	½	181-0181	BTS-180	
R32	1000Ω	½	181-0102	BTS-1000	
R33	1000Ω	½	181-0103	BTS-1000	
R34	1200Ω	†	181-1200	BTS-1200	Note 2
R35	330Ω	½	181-0331	BTS-330	
R36	1000Ω	½	181-0103	BTS-1000	
R37	10KΩ	½	181-0103	BTS-10K	
R38	6800Ω	½	181-0682	BTS-6800	
R39	12KΩ	½	181-0123	BTS-12K	
R40	220KΩ	½	181-0224	BTS-220K	
R41	220KΩ	½	181-0224	BTS-220K	
R42	470KΩ	½	181-0474	BTS-470K	
R43	47Ω	½	181-0470	BTS-47	
R44	4700Ω	½	181-0472	BTS-4700	
R45	6800Ω	½	181-0682	BTS-6800	
R46	12KΩ	2	163-0123	BTS-12K	
R47	12KΩ	2	163-0123	BTS-12K	
R48	12KΩ	2	163-0123	BTS-12K	
R49	330KΩ	½	181-0334	BTS-330K	
R50	1 Meg	½	181-0105	BTS-1Meg	
R51	180KΩ	½	181-0184	BTS-180K	
R52	47KΩ	½	181-0473	BTS-47K	
R53	100Ω	½	181-0101	BTS-100	
R54	1000Ω	½	181-0102	BTS-1000	
R55	100KΩ	½	† 181-0103	BTS-100K	
R56	68KΩ	½	181-0683	BTS-68K	
R57	15Meg	½	181-0156	BTS-15Meg	
R58	220KΩ	½	181-0224	BTS-220K	
R59	100KΩ	½	181-0104	BTS-100K	
R60	100KΩ	½	181-01045	BTS-100K	
R61	180KΩ 5%	½	181-01845	BTS-180K 5%	
R62	68Ω	½	181-0680		
R63	10KΩ	½	181-0103	BTA-10K	
R64	47Ω	½	181-0470	BTS-47	
R65	68ΩΩ	½	183-0681	BTS-680	
R66	680Ω	2	183-0681	BTS-680	
R67	470KΩ	½	181-0474	BTS-470K	
R68	1.2Meg	½	181-0125	BTS-1.2Meg	Note 3
R69	330KΩ	½	181-0334	BTS-330K	
R70	120KΩ	½	181-0124	BTS-120K	
R71	33KΩ	½	181-0323	BTS-33K	
R72	6800Ω	2	183-0682	BTS-6800	
R73	470KΩ	½	181-0474	BTS-470K	Note 4
R74	56KΩ	½	181-0563	BTS-56K	Note 1
R75	3300Ω	½	181-0332	BTS-3300	Note 1
R76	100KΩ	½	181-0101	BTS-100K	
R77	12KΩ	½	181-0123	BTS-12K	
R78	470KΩ	½	181-0474	BTS-470K	
R79	22 Meg	½	181-0226	BTS-22Meg	
R80	33KΩ	½	181-0333	BTS-33K	
R81	82KΩ	½	181-0823	BTS-82K	
R82	22KΩ	½	181-0223	BTS-22K	
R83A	8200Ω	}	± 190-0012	BTS-8200	
B	8200Ω			BTS-8200	
R84	1.5Meg	½	181-0155	BTS-1.5Meg	
R85	33KΩ	½	181-0333	BTS-33K	
R86	220KΩ	½	181-0224	BTS-220K	
R87	680KΩ	½	181-0684	BTS-680K	
R88	100KΩ	½	181-0104	BTS-100K	
R89	10KΩ 5%	½	181-01035	BTS-10K 5%	
R90	470KΩ	½	181-0474	BTS-470K	
R91	1000Ω	½	183-0102	BTA-1000	
R92	470KΩ	½	181-0474	BTS-470K	
R93	56ΩΩ	½	181-0561	BTS-560	
R94	56ΩΩ	½	181-0561	BTS-560	
R95	1000Ω	½	181-0102	BTS-1000	
R96	2300Ω	½	181-0222	BTS-2200	
R97	100KΩ	½	181-0104	BTS-100K	
R98	100KΩ	½	181-0104	BTS-100K	
R99	27KΩ	½	181-0273	BTS-27K	
R100	3300Ω	½	182-0333	BTA-3300	
R101	4.7Meg	½	181-0475	BTS-4.7Meg	
R102	4.7Meg	½	181-0475	BTS-4.7Meg	
R103	5600Ω	½	183-0562	BTA-5600	
R104	120KΩ	½	181-0124	BTS-120K	
R105	68KΩ	½	181-0683	BTS-68K	
R106	3300Ω	½	181-0332	BTS-3300	
R107	470KΩ	½	181-0474	BTS-470K	
R108	100Ω	½	181-0101	BTS-100	
R109	820Ω	½	181-0821	BTS-820	
R110	100Ω	½	181-0101	BTS-100	
R111	18KΩ	2	183-0183	BTP-18K	
R112	180Ω	2	183-0181	BTA-1000	Note 5
R113	100ΩΩ	½	181-0101		
R114	2.7Ω	½	189-0035		
R115	100KΩ	2	183-0104	BTP-100K	
R116	68Ω	10	187-0013		
R117	33KΩ	2	189-0026	BTP-33K	Note 1
R118	33KΩ	2	189-0026	BTS-33K	Note 1
R119	120Ω	½		BTS-120	Note 1
R120	220KΩ	2	183-0224	BTP-220K	Note 1
R121	120KΩ	1	182-0124	BTA-120K	Note 1

Note 2. Some models may use a 1500Ω resistor in this application.
* Items R83A, R83B, C75A, C75B, C75C are combined in one unit.
† Items C64A, C64B, C64C, R55 are combined in one unit.
Note 1. Not used in all models.
Note 2. Some models may use a 1500Ω resistor in this application.
Note 3. Some Models may use a 2.7Meg resistor in this application.
Note 4. Some Models may use a 180KΩ resistor in this application.
Note 5. Some Models may use a 56KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	SYLVANIA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC	650VCT @1.72A	5VAC .220ADC @ 3A	141-0039 ①						
		SEC. 3	SEC. 4	SEC. 5						
		6.3VAC @1.19A	6.3VAC @ 9A							

① Sylvania's replacement shown part #141-0024 socket type trans. uses bracket for 5U4 welded to half shell.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	SYLVANIA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T2	Vert. Osc. Trans.	242-0002	A-8125	A-3003	A-97X	B6702		
T3	Horiz. Output Trans.	241-0011	A-8135① ②	HVO-9 ② MWC-1① ⑤	D-24 & WC-1① ⑤	232T① ②	F941① ③④	
T4	Vert. Output Trans.	241-0008	A-8112	A-3036	A-99X①	204T2 ①	Z1803	
T5A	Yoke - Horiz. (20MH)	100-0009						
B	Yoke - Vert. (36MH)							
T6	Width (.5MH-5MH)			MWC-2⑦	WC-12⑧			

① Drill new mounting holes.
② Connect original terminal #6 to new terminal #4, original #5 to new #3, original #4 to new #3, original #3 to new #1, original #1 to new #6, original #2 to new #7.
③ Connect original terminal #6 to new terminal #9, original #5 to new #8, original #4 to new #7, original #3 to new #1.
Connect primary of MWC-1 across terminals #1 and #3. Secondary to AFC if picture is out of phase, reverse secondary.
④ Connect original terminal #6 to new terminal #9, original #5 to new #8, original #4 to new #7, original #3 to new #1.
Use width coil (with AGC winding) with inductance range of approximately 3-29MH width coil connected across terminals #1 and #3. AGC winding to AFC if picture is out of phase, reverse AGC winding.
⑤ Connect terminal #8 to terminal #7, then connect original terminal #6 to new terminal #9, original #5 to new #6 and #7, original #4 to new #5, original #3 to new #1. Connect primary of WC-11 across terminals #1 and #3. Secondary to AFC. If picture is out of phase, reverse secondary.
⑥ Drill one new mounting hole.
⑦ Enlarge mounting hole.
⑧ Connect to coded blue and green terminals.
⑨ Connect original terminal #6 to new terminal #10, original #5 to new #8, original #4 to new #7, original #3 to new #3, original #1 to new #1, original #3 to new #2.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI.	IMPEDANCE SEC.	SYLVANIA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T7	4.7KΩ	3.5Ω	143-0023	A-3849	A-3019	S-5Z	Z1102	TS-24551	

TRANSFORMER (HALOLIGHT)

ITEM No	RATING PRI.	RATING SEC. 1	RATING SEC. 2	SYLVANIA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T8	117VAC ⑩ 14A	1140VAC		141-0030 ①						

① Not used in all models.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V C. IMP.	SYLVANIA PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1A	6"	PM	3.5Ω	539-0602	5T-108 Mod P6-X	6A31	① Used in models 300, and 320 ② Used in models 325 and 301
B	5"	PM	3.5Ω	539-0503 ①	5T-105 Mod P5-X	5A1	
C	8"	PM	3.5Ω	539-0802 ②	5T-115 Mod P8-V		

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Trans.	00CT	00CT					
L2	Ant. Coils	0Ω						
L3	UHF Ant. Coil	0Ω						
L4	Ant. Coil	0Ω						Channel 13
L5	RF Coil	0Ω						Channel 13
L6	RF Coil	0Ω						
L7	Mixer grid coil	0Ω						Channel 13
L8	Mixer plate coils	0Ω						
L9	Fil. Choke	0Ω						
L10	Osc. plate coil	00CT						Channel 13 Channel 6
L11	Osc. Coil	0Ω						
L12	Osc. Coils	0Ω						
L13	Conv. Plate	.1Ω						
L14	1st Video IF	.1Ω		119-0002				Includes trap
L15	2nd Video IF	.1Ω	.1Ω	119-0003			6233	Includes trap
L16	Fil. Choke	0Ω		147-0014		19-3001	TV-189	4604 .7 Microhenry
L17	3rd Video IF	.1Ω	.1Ω	119-0004				6233 Includes trap
L18	4th Video IF	.2Ω	.1Ω	119-0005				6234
L19	Cathode trap	0Ω	0Ω	118-0011		20-1045		6219
L20	5th Video IF	.1Ω	.1Ω	128-0001				6234 * Includes 1N105 crystal Detector
L21	Series Peak. coil	1.5Ω		118-0010				4612 9.6 Microhenries
L22A	Series Peak. coil	5.5Ω		131-2003		19-3125	TV-194	4644 135 Microhenries
B	Shunt. Peak. coil	7.5Ω				19-3250	TV-195	6181 250 Microhenries
L23	4.5MC Trap	5.5Ω		130-0001		20-1005	TV-151	1470
L24A	Series Peak. coil	4.4Ω		131-2008		19-3093	TV-181	6177 96 Microhenries
B	Shunt Peak. coil	9Ω				19-3300		4565 330 Microhenries
L25	Sound IF	5.5Ω		130-0001		17-3400	TV-151	1469
L26	Ratio Det.	12Ω	1.5ΩCT	128-0008		17-3497	TV-115	6205 Tertiary winding - .85Ω
L27	Horiz. Osc.	46Ω		133-0001		19-1578	TV-183 †	6210 †
L28	RF Choke	1.5Ω		118-0010				4612 9.6 Microhenries
L29	RF Choke	1.5Ω		118-0010				4612 9.6 Microhenries
L30	RF Choke	1.5Ω		133-0002				9.6 Microhenries

* Use adaptor plate and add 1N105 crystal detector externally.
† Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT & 100 %)	SYLVANIA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L31	.220ADC	39.5Ω	1.1HY	145-0004	C-2326	C-2996	C-23x	C5037①	T-35C44

① Drill one new mounting hole.

SYLVANIA MODELS SERIES 105-14, 105-14U, 120-20, 120-20U, 300, 300U, 301, 301U, 306, 306U, 320, 325, 325U, 326, 326U (Ch. 1-514, -1, -3, -4, -5, -6, 1-520-0, -1, -3, -4, -7, -8)

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SYLVANIA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	1/4A	191-0014	487-008	313.250 (3AG S/B-1/4A)	357001	MDL 1/4	4405

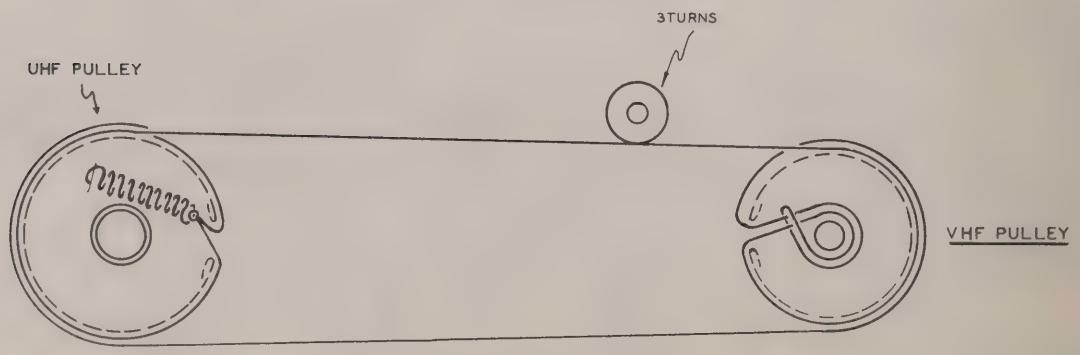
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SYLVANIA PART No.	SYLVANIA PART No.		
M2	1N105		1N105		Video detector (clip-in)
M3	1N82		1N82 or 1N82A		UHF Mixer
M4	1N82		1N82 or 1N82A		UHF Osc. doubler

MISCELLANEOUS

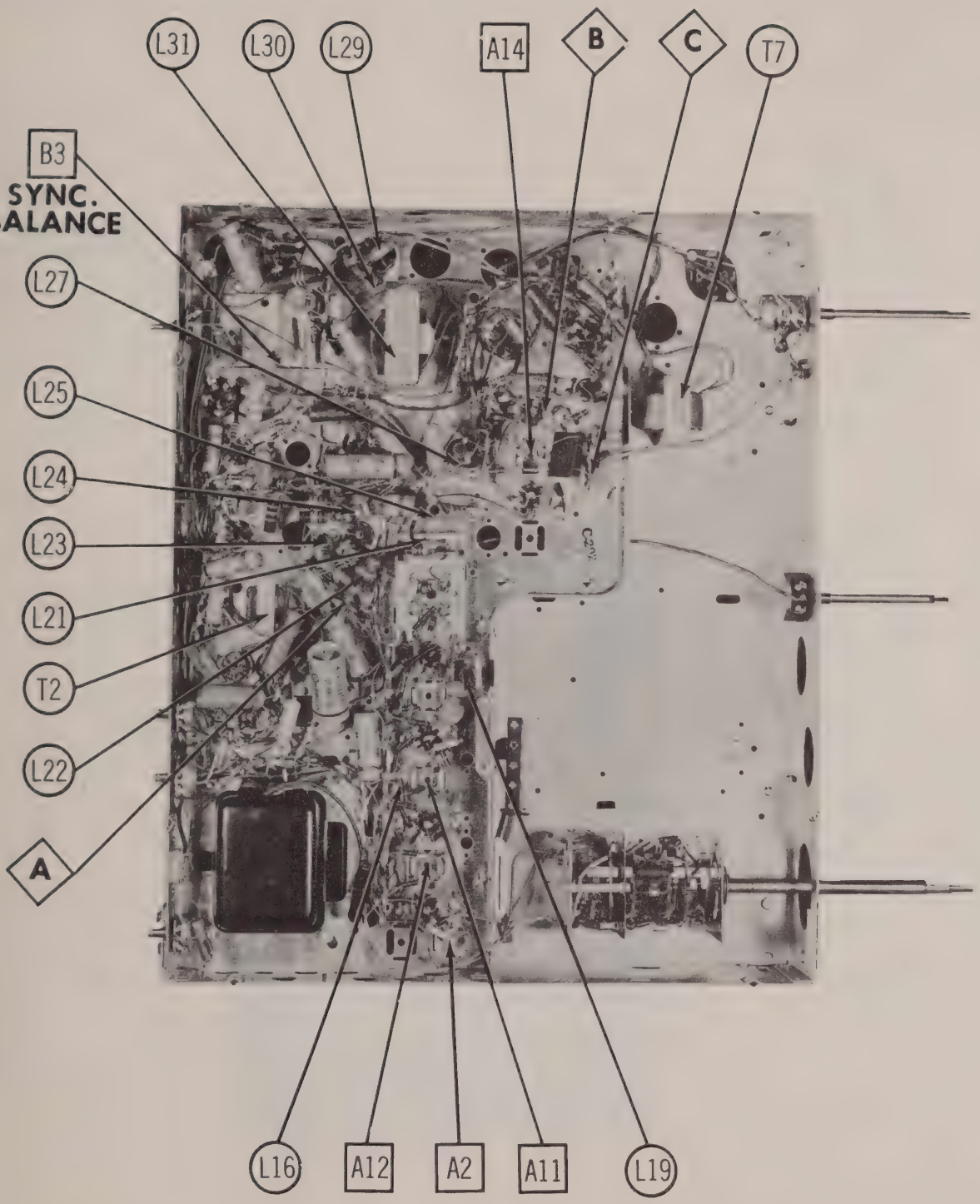
ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M5A	Tube	611-1701	Cold cathode - "HaloLight" (301 Models only)
B	Tube	611-2100	Cold cathode - "HaloLight" (326 Models only)
M6A	Tuner	323-0034	VHF - Chassis 1-514-1
B	Tuner	323-0044	VHF - Chassis 1-514-3
C	Tuner	323-0037	VHF - Chassis 1-514-4
D	Tuner	323-0033	VHF - Chassis 1-520-1
E	Tuner	323-0045	VHF - Chassis 1-520-3
F	Tuner	323-0038	VHF - Chassis 1-520-4
G	Tuner	323-0041	VHF - Chassis 1-520-7
H	Tuner	323-0035	VHF - Chassis 1-520-8
J	Tuner	323-0048	VHF - Chassis 1-514-5, 6
M7	Tuner	323-0019	VHF - Chassis 1-514-4, 1-520-4, 1-520-8, 1-514-6
M8	Switch	572-0004	Fringe (AGC) Chassis 1-514-3, 1-514-4, 1-520-3, -4, -8
M9	Switch	577-0004	UHF/VHF changeover, (UHF Models only)
M10	Focus Magnet	400-0014	Includes centering device
M11	Ion Trap	400-0013	
M12	Correction Magnet	400-0016	(2) used
M13	Switch	571-0009	SPST slide - "HaloLight" control
B1 & B2	Trimmer Cap.	172-0032	(2) horiz. drive & sync balancing (70-470MMF)
	Knob	744-0022	Outer - off/on - volume control
	Knob	740-0045	Contrast
	Knob	744-0025	"HaloLight" (326 Models)
	Knob	740-0038	(2) horiz. hold & fringe (AGC)
	Knob	744-0023	Brightness
	Knob	740-0029	Fine tuning
	Knob	743-0022 *	Outer control and dial assy. Ch. 1-514-3, -4 (105-14 & 300 Models) Also, Ch. 1-520-0, -3, -4, -8 (120-20, 320, 325 & 326 Models)
	Knob	743-0023 *	Outer control and dial assy. Ch. 1-514-1, 5, 6 (105-14 & 301 Models, Also, Ch. 1-520-1, -7 (120-20, 320, 325 & 326 Models)
	Knob	743-0024 *	Outer control & dial assy. Ch. 1-514-1 (300 Models only)
	Dial	722-0027	UHF - Models 1-514-4, 1-520-4, -8
	Dial	722-0028	UHF dummy - Models 1-514-1, -3, 1-520-1, -3, -7
	Safety Glass	710-0011	17" Models
	Safety Glass	710-0009	21" Models
	Back Cover	760-0037	Assembly - 105-14 and 300 Models
	Back Cover	760-0051	Assembly - 120-20 Models
	Back Cover	760-0047	Assembly - 320 Models
	Back Cover	760-0050	Assembly - 325 Models
	Back Cover	760-0052	Assembly - 326 Models
	Back Cover	760-0056	Assembly - 301 Models

* That the same models may contain different chassis.
This will necessitate check of the chassis type when ordering these parts.

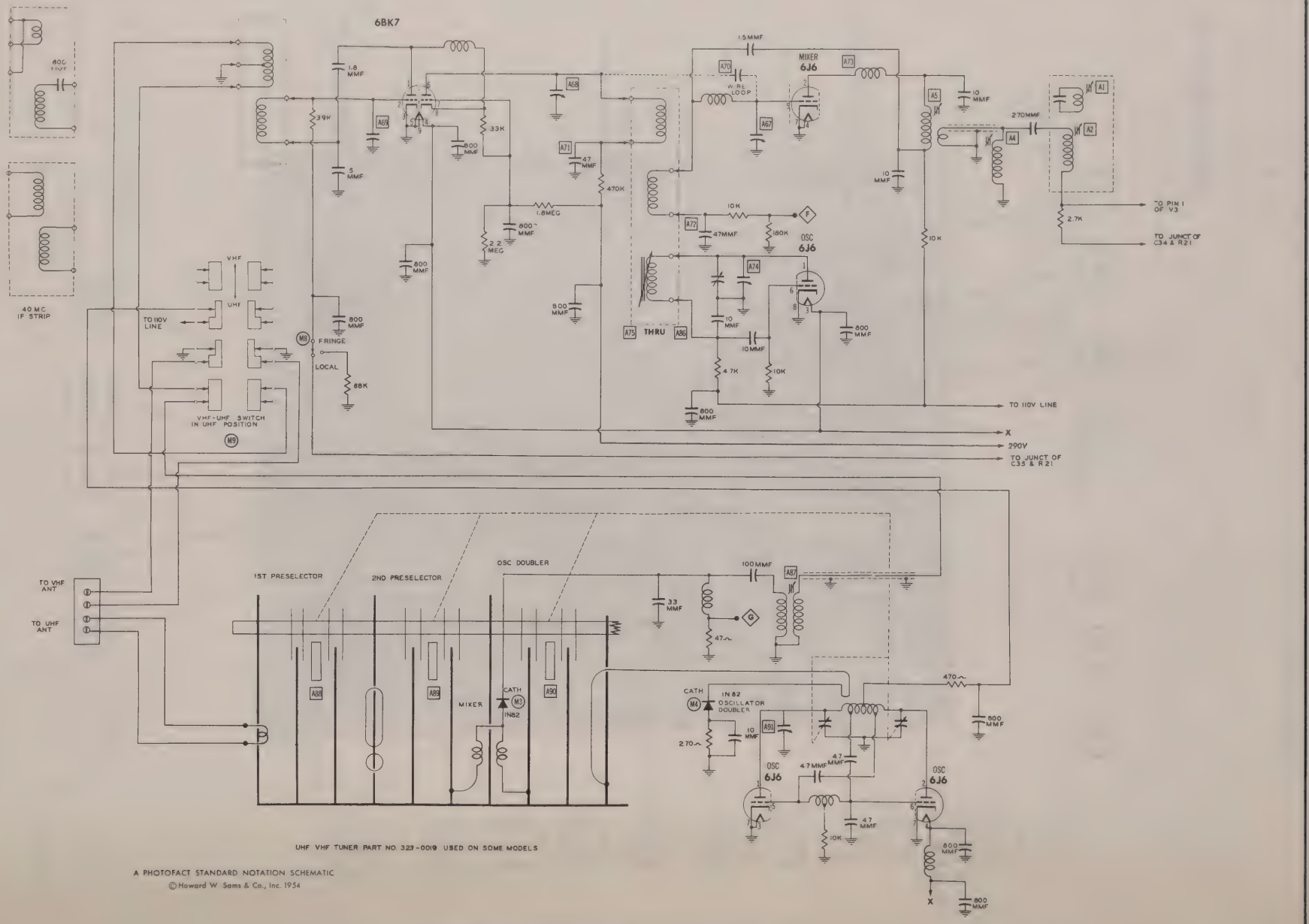


DRIVE CORD STRINGING

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



UHF VHF TUNER PART NO. 323-0019 USED ON SOME MODELS

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ALTERNATE TUNER SCHEMATIC

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
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3924 MEADE ST
DENVER, COLORADO

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M1. Check by substitution V17, V18, V19 and V20. Check waveform W15.

If Satisfactory	If Unsatisfactory
Check R114, R111, C91, T3, T5A and other associated components.	Check C90, C87, C88, R105, R107 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V17, V18, V19, V20 and V21. Check picture tube. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V20, V19, V18, V17 and V21. Check R114, R111, C91, T3, T5A, picture tube and other associated components for failure or change of value.

GENERAL

RASTER SOUND NO PIX

Follow procedure outlined under "Loss of Video".

RASTER PIX NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO SOUND NO PIX

Check by substitution V1, V2, V3, V4, V5 and V6. Check video detector assembly. Check Video IF strip components.

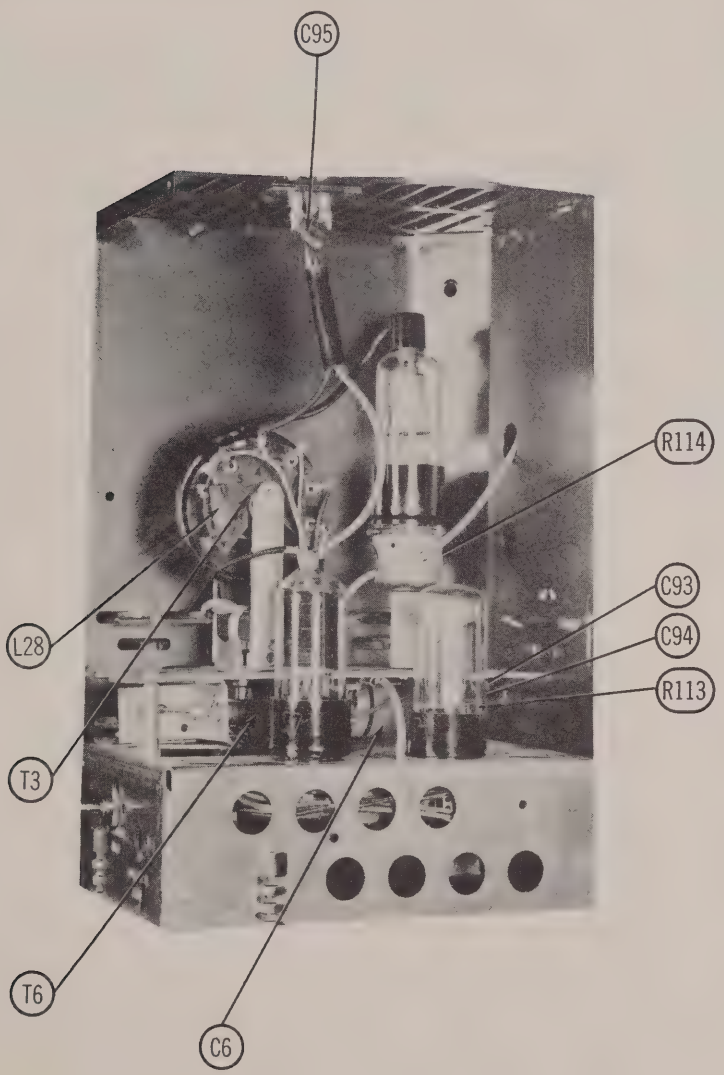
NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

INTERMITTENT STREAKS

Check video signal for interference pulses. Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



HIGH VOLTAGE COMPARTMENT

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removing the Channel Selector and Fine Tuning knobs.

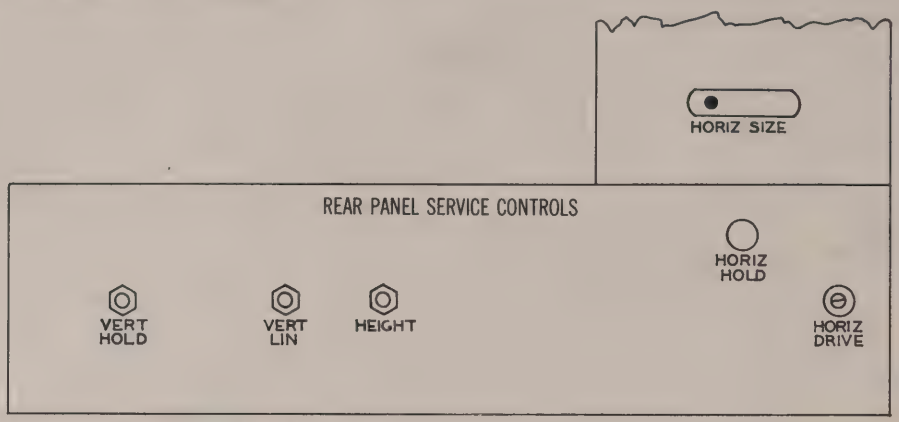
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety Glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See di sassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horiz. Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the Horiz. Hold Control at the center of its range and adjust the Horiz. Freq. Slug L27 until, picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L26 located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for Horiz. Sweep Circuit protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the P. M. Focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

ANTI-PIN CUSHION ADJUSTMENT

Reduce the picture size so that the sides of the raster are visible, and position the magnets so that all sides are straight lines and the corners are at right angles.

DISASSEMBLY INSTRUCTIONS

Remove 5 push on type control knobs from front panel.

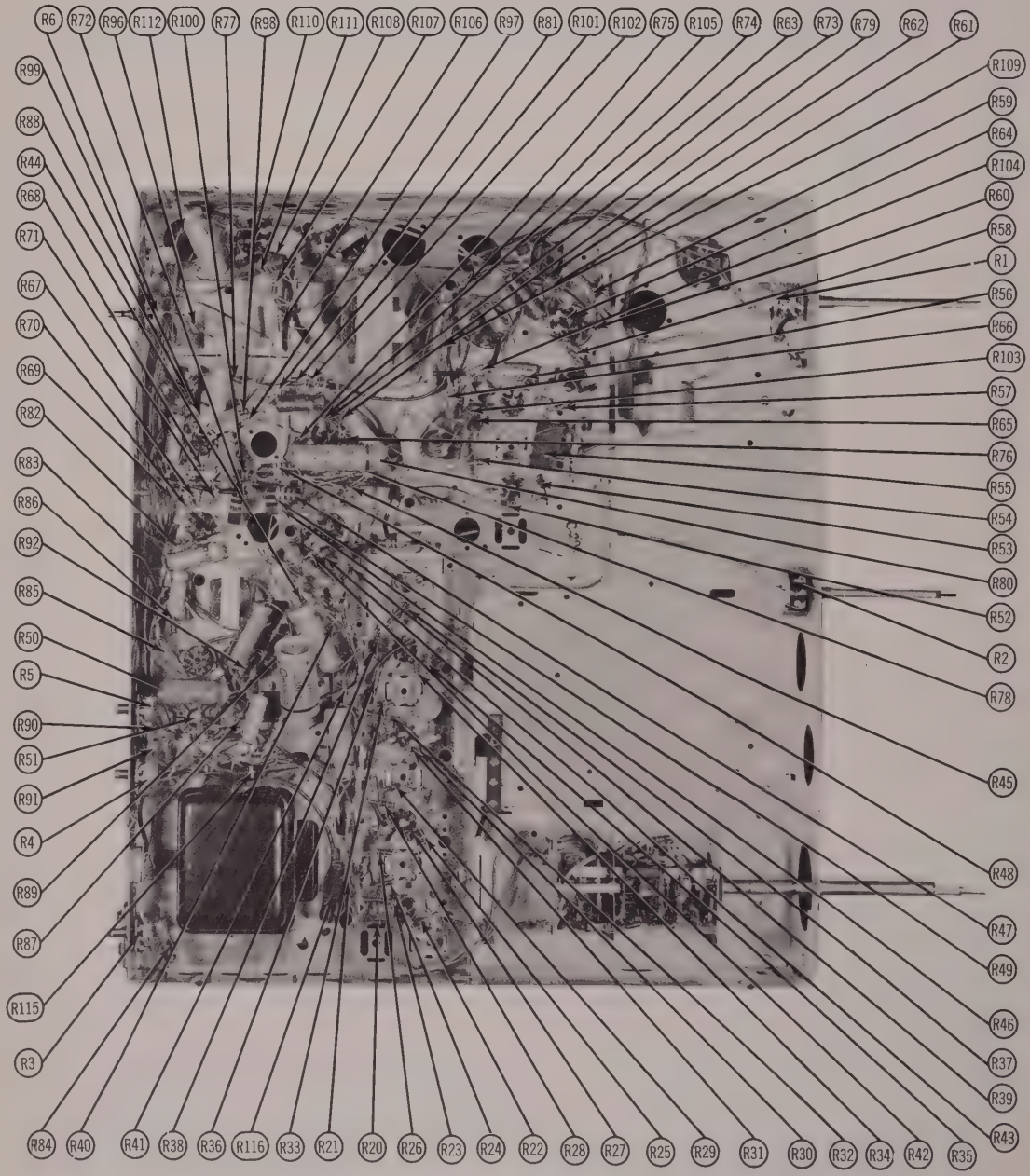
Disconnect built-in antenna.

Remove 7 wood screws from rear cover. Remove rear cover.

Disconnect speaker plug.

Remove 2 speaker nuts. Remove speaker.

Loosen 2 nuts from top of CRT. Remove 4 chassis bolts. Remove chassis.



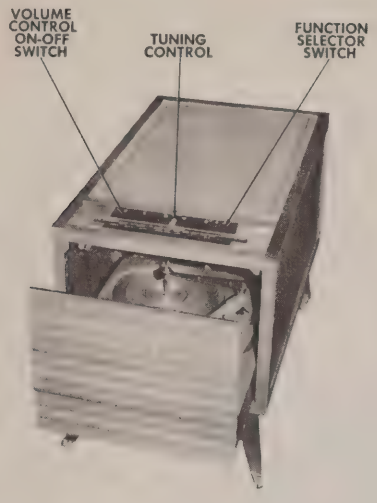
CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
DENVER, COLORADO

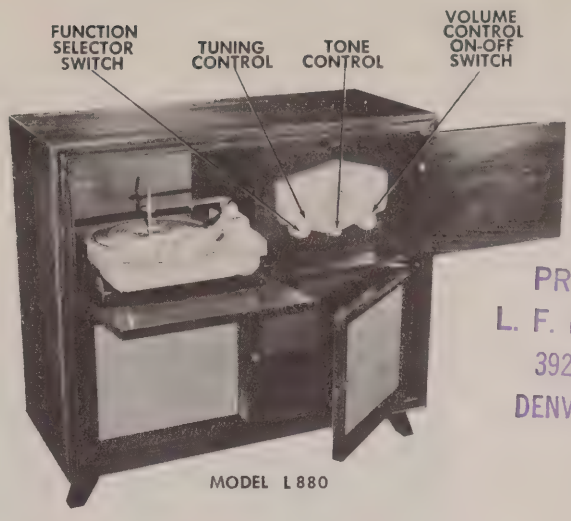
PROPERTY OF
DENVER, COLORADO

ZENITH
MODELS L845R, L846E, H (Ch. 8L21), L880 (Ch. 8L20)

ZENITH
MODELS L845R, L846E, H
(Ch. 8L21), L880 (Ch. 8L20)



MODEL L846



MODEL L880

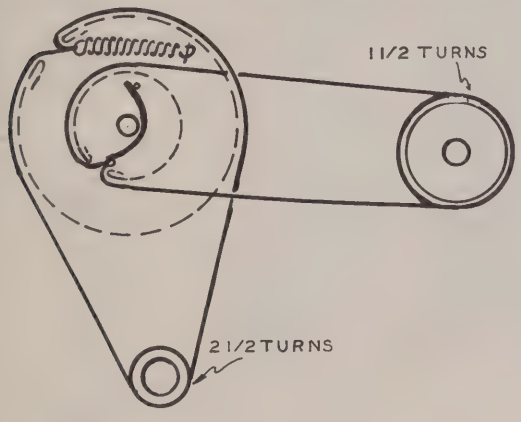
PROPERTY OF
L. F. BLANKENSI
3924 MEADE ST
DENVER, COLORADO

TRADE NAME	Zenith Models L845R, L846E, H (Ch. 8L21), L880 (Ch. 8L20)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.
TYPE SET	AC Operated AM-FM-Phono Combination Superheterodyne Receiver
TUBES (Eight)	Types 6BJ6 RF Amp., 12AT7 Conv., (2) 12BA6 IF Amp., 12AU6 Limiter, 19T8 Discriminator-AM Det.-AVC-AF Amp., 25L6GT Audio Output, 25Z6GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING .6 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	54-1620KC — FREQ.MOD. 88-108MC

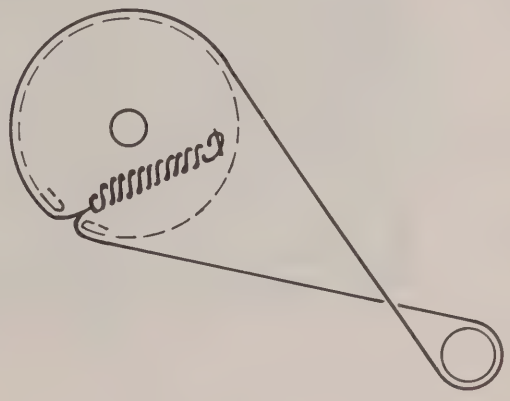
FOR SERVICE INFORMATION ON RECORD CHANGER UNIT, ZENITH MODEL S-14053, SEE PHOTOFACT SET #226 - FOLDER 13.

DISASSEMBLY INSTRUCTIONS (MODEL L846)

1. Remove the push-on type control knob. (Tone - at rear of cabinet).
2. Remove two wood screws holding rear cover. Remove cover.
3. Disconnect speaker, phono motor, phono pickup, antenna and dial light plugs.
4. Loosen coupling set screws on each control shaft. Slide the shafts back, down and then forward to release.
5. Release clamp holding phono motor, pickup and speaker leads.
6. Remove 4 wood screws holding fiberboard cover surrounding chassis.
7. Remove two wood screws holding chassis to top of cabinet. Remove chassis.
8. To remove dial assembly, remove the 4 metal screws holding dial.



CHASSIS 8L20



CHASSIS 8L21

DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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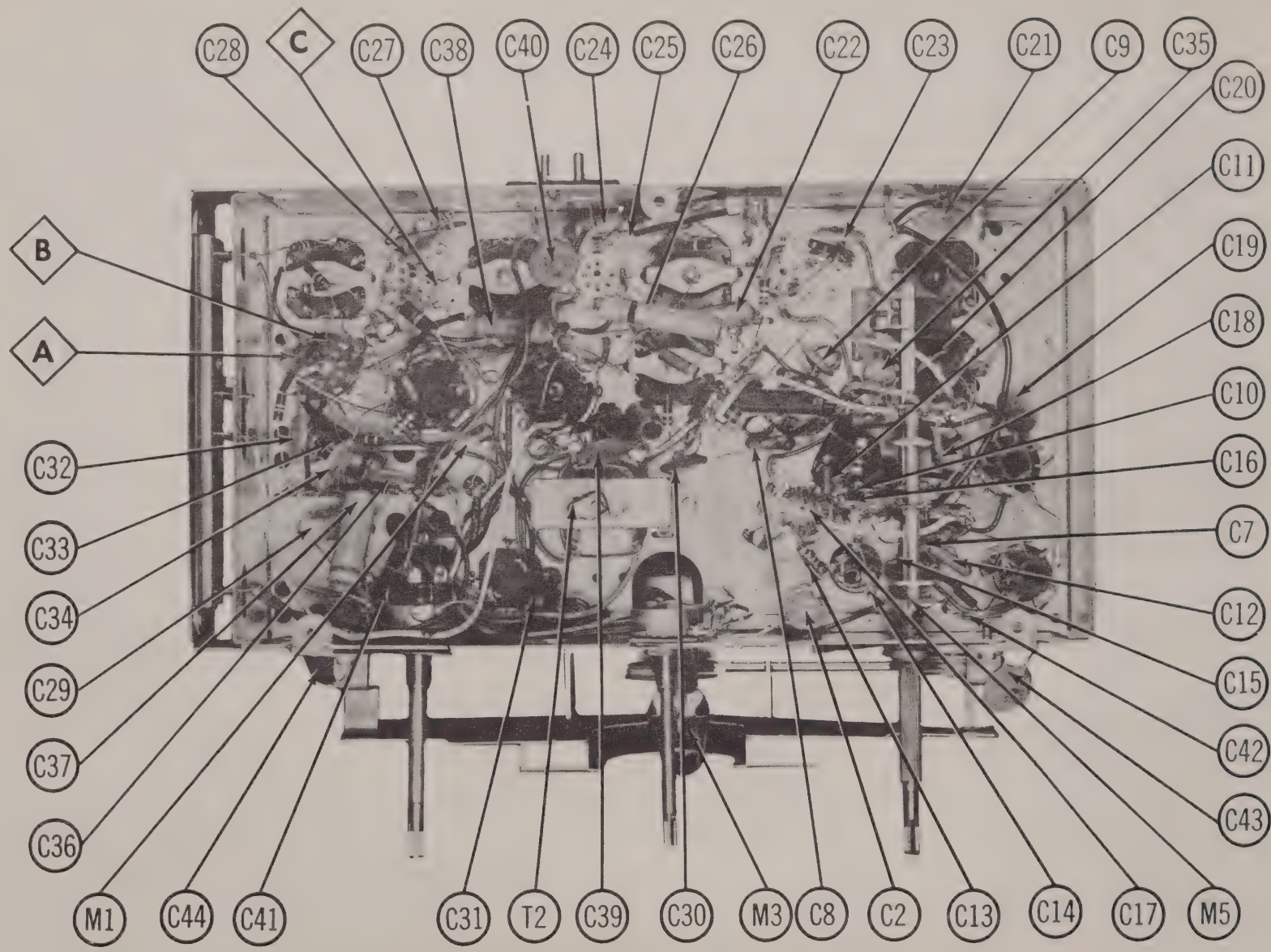
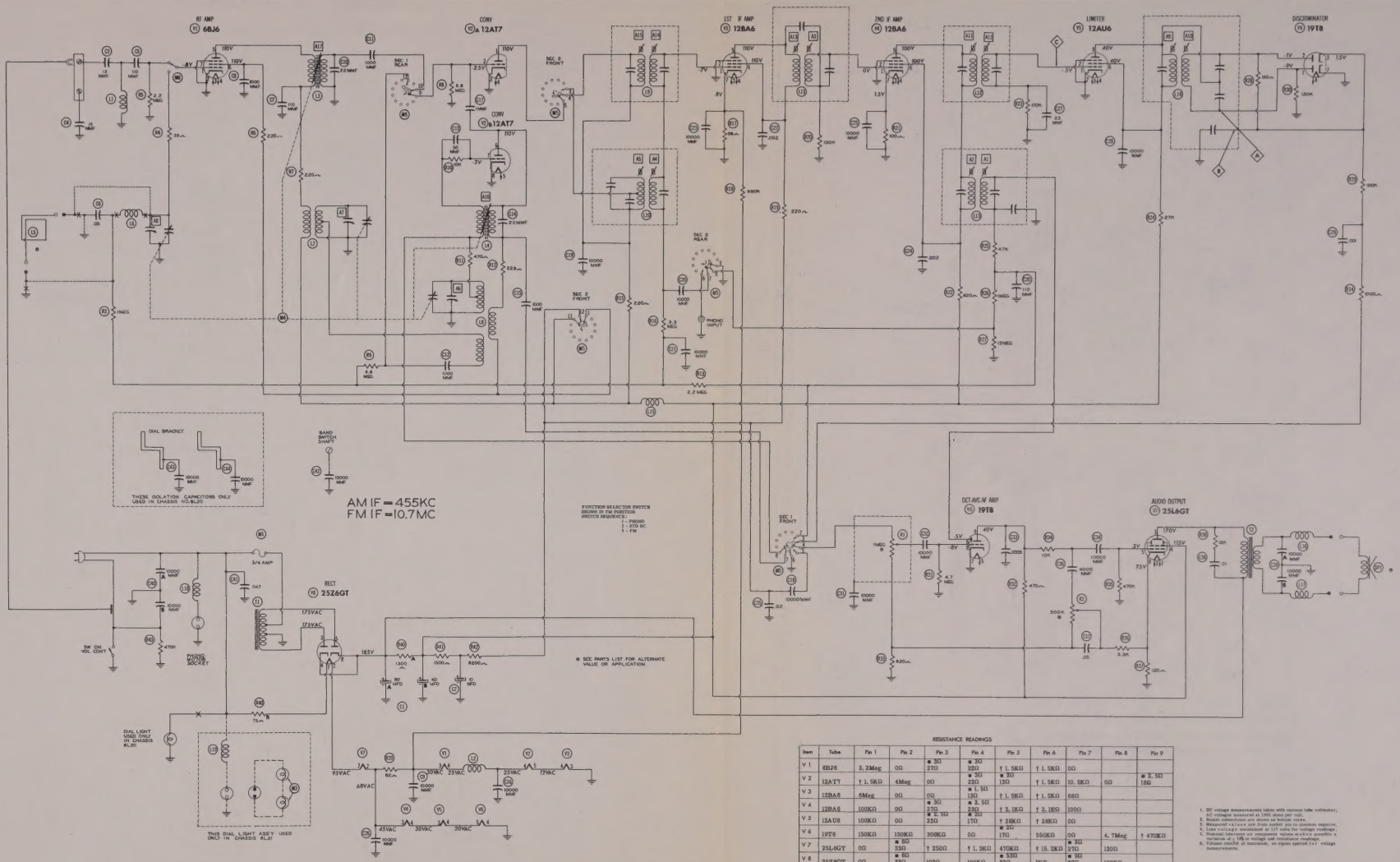


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BJ6	3.2Meg	0Ω	● 3Ω 27Ω	● 3Ω 22Ω	† 1.5KΩ	† 1.5KΩ	0Ω		
V 2	12AT7	† 1.5KΩ	4Meg	0Ω	● 3Ω 22Ω	● 2Ω 13Ω	† 1.5KΩ	10.5KΩ	0Ω	● 2.5Ω 18Ω
V 3	12BA6	6Meg	0Ω	0Ω	● 1.5Ω 13Ω	† 1.5KΩ	† 1.5KΩ	68Ω		
V 4	12BA6	100KΩ	0Ω	● 3Ω 27Ω	● 2.5Ω 23Ω	† 2.1KΩ	† 2.1KΩ	100Ω		
V 5	12AU6	100KΩ	0Ω	● 2.5Ω 23Ω	● 3Ω 17Ω	† 28KΩ	† 28KΩ	0Ω		
V 6	19T8	150KΩ	150KΩ	300KΩ	0Ω	● 25Ω 17Ω	550KΩ	0Ω	4.7Meg	† 470KΩ
V 7	25L6GT	0Ω	● 8Ω 33Ω	† 250Ω	† 1.3KΩ	470KΩ	† 15.2KΩ	● 3Ω 27Ω	120Ω	
V 8	25Z6GT	0Ω	● 8Ω 33Ω	102Ω	100KΩ	● 53Ω 32Ω	INF	● 3Ω 37Ω	100KΩ	

† MEASURED FROM PIN 4 OF V8.
● MEASURED ON CHASSIS 8L21.
MEASUREMENTS FOR CHASSIS 8L20 & 8L21 ARE IDENTICAL UNLESS OTHERWISE NOTED.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Tolerance of resistance measurements is ±20%, except where a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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234-14

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use Zenith alignment wrench 68-19 or equivalent.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM RADIO ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 2 (grid) of 12AT7 (V2). Low side to B-.	455KC (400~Mod)	AM	600KC	Across voice coil	A1, A2, A3, A4, A5	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1600KC	"	1600KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	"	1400KC	"	A7, A8	"

FM SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Use 2Meg isolating resistor in series with DC probe of VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.05MFD	High side to pin 1 (grid) of 12AU6 (V5). Low side to B-.	10.7MC (Unmod)	FM	Point on non-interference	DC probe to point Ⓐ. Common to chassis.	A9	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point Ⓑ. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
6.	"	High side to pin 1 (grid) of 12BA6 (V4). Low side to B-.	"	"	"	DC probe to pp point Ⓒ. Common to chassis.	A11 A12	Adjust for maximum deflection.
7.	"	High side to pin 1 (grid) of 12BA6 (V3). Low side to B-.	"	"	"	"	A13	"
8.	"	High side to pin 2 (grid) of 12AT7 (V2). Low side to B-.	"	"	"	"	A14 A15	"

FM SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
4.	.05MFD	High side to pin 1 (grid) of 12AU6 (V5). Low side to B-.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. amp. thru 10KΩ to point Ⓐ. Low side to chassis	A9	Adjust for curve of maximum amplitude and symmetry as in Fig. 1.
5.	"	"	"	"	"	Vert. amp. thru 10KΩ to point Ⓑ. Low side to chassis	A10	Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.
6.	"	High side to pin 2 (grid) of 12AT7 (V2). Low side to B-.	"	"	"	Vert. amp. thru 10KΩ to point Ⓒ. Low side to chassis	A11, A12 A13, A14 A15	Adjust for curve of maximum amplitude and symmetry as in Fig. 1. Continue alignment with step 9.

FM RF ALIGNMENT

Remove line antenna.
Slugs may be loosened by applying hot iron to cement.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	270Ω carbon resistor	High side thru 270Ω to FM antenna terminal "F". Low side to terminal "G".	98MC	FM	98MC	DC probe thru 2Meg to point Ⓒ Common to chassis	A16	Adjust for maximum deflection.
10.	"	"	"	"	"	"	A17	"

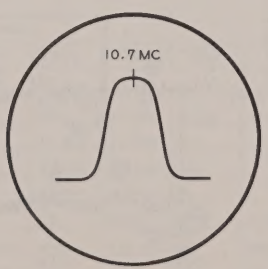


FIG. 1

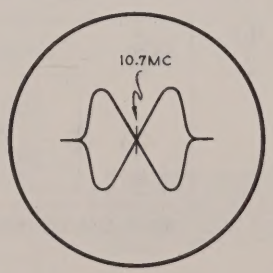


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		ZENITH PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BJ6	6BJ6	7CM	
V2	Converter	12AT7	12AT7	9A	
V3	1st IF Amp.	12BA6	12BA6	7BK	
V4	2nd IF Amp.	12BA6	12BA6	7BK	
V5	Limiter	12AU6	12AU6	7BK	
V6	Discriminator-AM Det-AVC-AF Amp.	19T8	19T8	9E	
V7	Audio Output	25L6GT	25L6GT	7S	
V8	Rectifier	25Z6GT	25Z6GT	7Q	

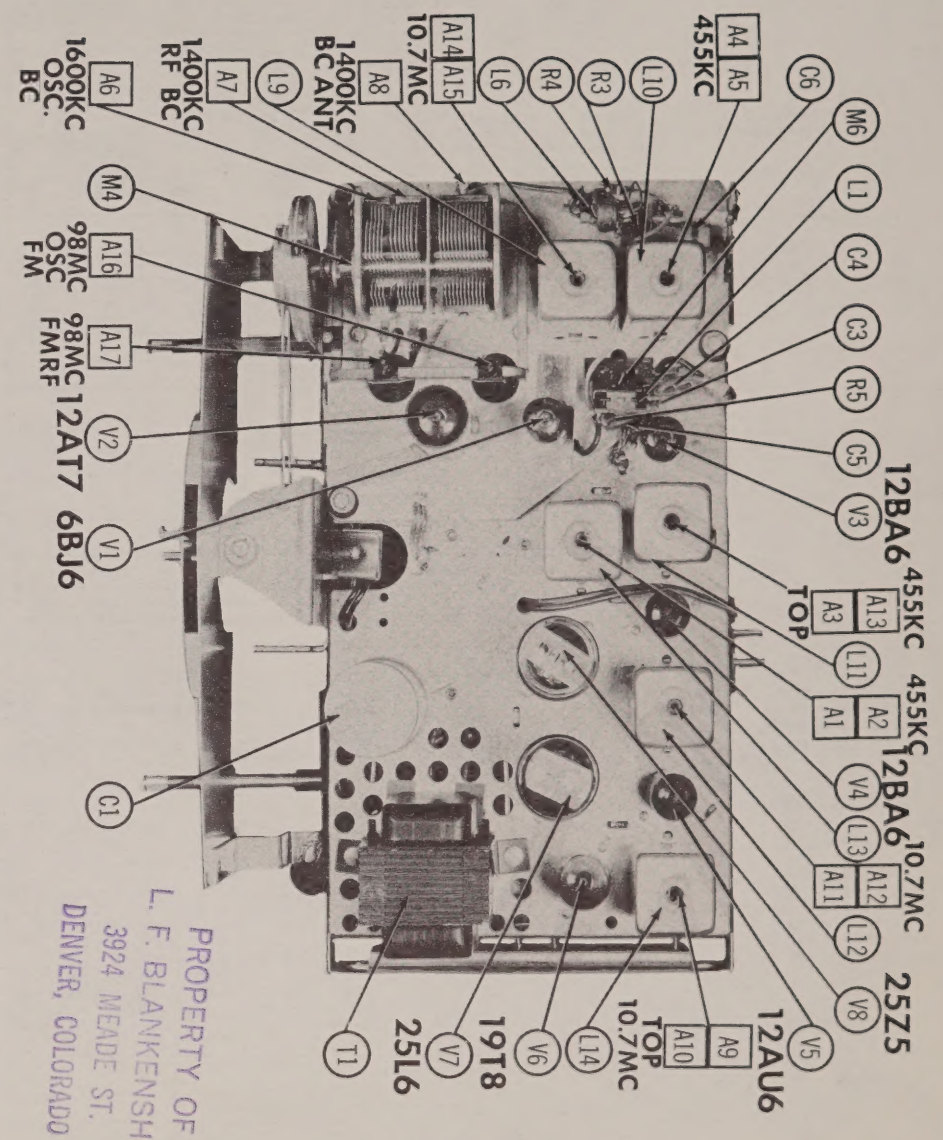
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲80	250	22-2105	AFH2-64		B048		FP413X	TVL-2582	
B	▲40	250								
C2	10	250	22-2154	PRS250/12		BR1025		TC52	TVA-1504	
C3	15		22-2140	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C4	15		22-2140	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C5	110		22-5							
C6	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C7	110		22-5							
C8	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C9	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C10	22		22-1506							
C11	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C12	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C13	50		22-1367							
C14	22		22-1506							
C15	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C16	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C17	1		22-1762							
C18	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C19	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C20	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C21	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C22	.002	600	22-1220	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C23	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C24	.002	600	22-1220	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C25	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C26	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C27	25		22-1507	SI25	D6-250		GP1K-250	UC-5425	5GA-Q25	
C28	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C29	.001	200	22-1717	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C30	110		22-5							
C31	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C32	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C33	.0005	500	22-854							
C34	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C35	.02	400	22-1379	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C36	4000		22-4	BPD-004	D6-402	TM5D4	GP2-333-402	DC-524	5HK-D4	
C37	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C38	.01	600	22-669	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C39A	10000		22-2276	BPD-2X01	DD3-103	TM5DS1	811-01	DCD-511	5HK-2S1	
B	10000						811-01			
C40A	10000		22-2276	BPD-2X01	DD3-103	TM5DS1	811-01	DCD-511	5HK-2S1	
B	10000						811-01			
C41	.047	400	22-1775	489ZX-05		PJ4S47		PT4147	4TM-S47	
C42	10000		22-3	BPD-01	DD-103	TM5D1	811-01	DC-511	5HK-S1	
C43	10000		22-3	BPD-01	DD-103	TM5D1	811-01	DC-511	5HK-S1	Note 1
C44	10000		22-3	BPD-01	DD-103	TM5D1	811-01	DC-511	5HK-S1	Note 1

Note 1. Used only in Ch. 8L20.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	63-2131	Q11-137		AB-69		Volume
B	Shaft		Not Req.	Not Req.		AK-4		Attach to R1A } Chassis
C	Switch		Not Req.	76-1		KB-1		Attach to R1A } 8L20
R1A	1Meg	½	63-2861	Q11-137	AG-61-S	AB-69	U-54	Volume
B	Shaft		Not Req.	Not Req.	RS-5	AK-9	DS-36	Attach to R1A } Chassis
C	Switch		Not Req.	76-1	SWB	KK-1	US-26	Attach to R1A } 8L21
R2A	500K	½	63-2132				U-50	Tone } Chassis
B	Shaft		Not Req.				DS-37	Attach to R2A } 8L20
R2A	500K	½	63-2862	Q11-133	AG-58-S	AB-617	U-50	Tone } Chassis
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A } 8L21

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ZENITH PART No.	IRC PART No.	NOTES
R3	1 Meg	½	63-1912	BTS-1Meg	
R4	39Ω	½	63-1726	BTS-39	
R5	2. 2Meg	½	63-1926	BTS-2. 2Meg	
R6	220Ω	½	63-1758	BTS-220	
R7	220Ω	½	63-1758	BTS-220	
R8	6. 8Meg	½	63-1947	BTS-6. 8Meg	
R9	6. 8Meg	½	63-1947	BTS-6. 8Meg	
R10	10KΩ	½	63-1827	BTS-10K	
R11	470Ω	½	63-1772	BTS-470	
R12	220Ω	½	63-1758	BTS-220	
R13	2. 2Meg	½	63-1926	BTS-2. 2Meg	
R14	1000Ω	½	63-1786	BTS-1000	
R15	220Ω	½	63-1758	BTS-220	
R16	3. 3Meg	½	63-1933	BTS-3. 3Meg	
R17	68Ω	½	63-1736	BTS-68	
R18	680KΩ	½		BTS-680K	Note 1
R19	220Ω	½	63-1758	BTS-220	
R20	100KΩ	½	63-1870	BTS-100K	
R21	100Ω	½	53-1744	BTS-100	
R22	820Ω	½	63-2091	BTS-820	
R23	100KΩ	½	63-1870	BTS-100K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ZENITH PART No.	IRC PART No.	NOTES
R24	27KΩ	½	63-1845	BTS-27K	
R25	47KΩ	½	63-1856	BTS-47K	
R26	1 Meg	½	63-1912	BTS-1 Meg	
R27	15 Meg	½	63-1961	BTS-15Meg	
R28	150KΩ	½	63-1876	BTS-150K	
R29	100KΩ	½	63-1870	BTS-100K	
R30	150KΩ	½	63-1876	BTS-150K	
R31	4. 7Meg	½	63-1940	BTS-4. 7Meg	
R32	470KΩ	½	63-1898	BTS-470K	
R33	820Ω	½	63-1782	BTS-820	
R34	10KΩ	½	63-1828	BTS-10K	
R35	470KΩ	½	63-1898	BTS-470K	
R36	3300Ω	½	63-1806	BTS-3300	
R37	120Ω	1	63-1981	BTA-120	
R38	15KΩ	½	63-1834	BTS-15K	
R39	82Ω	2	63-2428		
R40A	1300Ω	20	63-2068		
B	75Ω	5			
R41	1500Ω	½	63-1793	BTS-1500	
R42	8200Ω	1	63-1576	BTA-8200	
R43	470KΩ	½	63-1898	BTS-470K	

Note 1. Some models may use a 220KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA ZENITH PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC ⓐ .6A Tap ⓐ 350VCT 114ADC				95-1188					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ZENITH PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T2	2. 8KΩ	3. 3Ω	95-1272	A-3849	A-3018	S-1X ①	Z1104 ①	TS-26S50	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA ZENITH PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	12"	PM	3. 3Ω	49-702	12J11	12A4A	Used in chassis 8L20
B	10"	PM	3. 2Ω	49-723	10J11	10A31	① Alternate 10" PM speaker } Chassis
				49-736 ①			} 8L21

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Coil	0Ω		S-16408				
L2	Fil. Choke			S-13997			4612	9. 5 Microhenries
L3	FM RF Coil	0Ω	0Ω	S-15743				
L4	FM Osc. Coil	0Ω	0Ω	S-15691				
L5A	AM Loop Ant.	0Ω		S-16841				
B	Am Loop Ant.	1. 2Ω		S-20042				Used in chassis 8L21
L6	AM Ant.							Used in chassis 8L20
	Loading Coil	3. 5Ω		S-18812	19-3250	TV-185	4646	223 Microhenries
L7	AM RF Coil	2. 8Ω	11Ω	S-16344				Sec. tapped ⓐ 3. 4Ω
L8	AM Osc. Coil	1. 2Ω	9Ω	S-16345				Sec. tapped ⓐ 3. 7Ω; pickup winding= 1. 3Ω
L9	1st FM IF	. 5Ω	. 5Ω	95-1201	16-6665*	FM-251	1451	
L10	1st AM IF	17Ω	17Ω	95-1248				Pri. tapped ⓐ 4. 6Ω
L11	2nd FM & AM IF	24Ω		95-1251				Includes RF Choke & Coupling capacitor
L12	3rd FM IF	. 5Ω	. 5Ω	95-1150	16-3487 †	FM-251 ▲	1451 ▲	
L13	3rd AM IF	17Ω	17Ω	95-1102	16-6770 ■	RC-355 ■	12-C6 ■	
L14	FM Discrim.	. 3Ω	. 4Ω	95-1153	17-3484 ◓	FM-250 ‡	1452 ‡	
L15	RF Choke	. 1Ω		20-337			4608	3. 8 Microhenries
L16	Audio Choke	. 1Ω		20-337			4608	3. 8 Microhenries
L17	Audio Choke	. 1Ω		20-337			4608	3. 8 Microhenries
L18	Line Choke	. 1Ω		20-337			4608	3. 8 Microhenries
L19	Line Choke	. 1Ω		20-337			4608	3. 8 Microhenries

* Drill mounting hole.
† Remove center spade bolt mounting support and use adaptor plate.
▲ Remove center spade bolt mounting support.
■ Use adaptor plate and remove center spade bolt mounting support.
◓ Add diode filter cap. externally. Drill new mounting holes and remove center spade bolt mounting support.
‡ Add diode filter cap. externally and remove center spade bolt mounting support.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG P/T	3/4A 250V	136-25		318. 750 (3AG P/T-3/4A)		GJV 3/4	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA ZENITH PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M2	142-72							

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Dial light	100-97	# 110C bayonet (2 used in chassis 8L21)
M4A	Tuning cap	22-2400	3 section (18-370MMF, 11-200MMF, 11-85MMF) chassis 8L20
B	Tuning cap	22-2482	3 section (22-482MMF, 11-210MMF, 12-85MMF)chassis 8L21
M5A	Switch	85-534	Function-chassis 8L20
B	Swtich	85-529	Function-chassis 8L21
M6	Switch	85-505	Antenna (SPDT) operated by M5
	Cabinet	14-1478R	Model L880R
	Cabinet	14-1564E	Model L846E
	Cabinet	14-1564H	Model L846H
	Cabinet	14-1598R	Model L845R
	Dial crystal	192-138	Model L880R
	Dial scale	26-499	Model L846E, R, L845R
	Knob	S-19316	Off-on volume assembly-model L880R
	Knob	46-1168	Volume and tuning-8L21 chassis (L846E, R & L845R)
	Knob	46-1041	Tuning- model L880R
	Knob	46-1043	Function-model L880R
	Knob	46-1166	Function 8L21 chassis (L846E, R, & L845R)
	Knob	46-1053	Tone-model L880R
	Knob	47-1170	Tone-8L21 chassis (L846E, R & L845R)